植物研究雑誌
J. Jpn. Bot.
79: 101–139 (2004)

Taxonomy and Distribution of *Desmodium* and Related Genera (Leguminosae) in Malesia (I)

Hiroyoshi OHASHI

Botanical Garden, Graduate School of Science, Tohoku University, Sendai, 980-0862 JAPAN

(Received on November 8, 2003)

A taxonomic and phytogeographic account of *Desmodium* and its related genera in Malesia is presented as a precursory treatment of these genera for the Flora Malesiana. Sixty-four species in 13 genera are recognized: *Aphyllodium* (3 spp.), *Codariocalyx* (3 spp.), *Dendrolobium* (8 spp.), *Desmodiastrum* (1 sp.), *Desmodium* (35 spp. of which 27 native to Malesia and 8 introduced from America), *Hanslia* (2 spp.), *Hegnera* (1 sp.), *Hylodesmum* (4 spp.), *Monarthrocarpus* (1 sp.), *Ohwia* (1 sp.), *Phyllodium* (3 spp.), *Tadehagi* (1 sp.), and *Trifidacanthus* (1 sp.). They are enumerated with keys to genera, species and infraspecific taxa, selected synonyms and bibliography related to the Malesian flora, representative specimens, and distribution. Of the 56 species native to Malesia eight (14 %) are endemic to the region; 29 (52 %) are distributed in Malesia and continental Asia but not in Australia; 11 (20 %) are common in Malesia and Australia but not in continental Asia; and eight (14 %) are found in all these areas. Based on the distribution analysis, a differentiation pattern of the species in these genera in Malesia is presumed.

This paper is divided into two parts. *Aphyllodium*, *Codariocalyx*, *Dendrolobium*, *Desmodiastrum*, and *Desmodium* are treated in the first part. Following new combinations or new status are proposed: *Codariocalyx microphyllus* (Thunb.) H. Ohashi, *Desmodiastrum parviflorum* (Dalz.) H. Ohashi, *Desmodium nemorosum* F. Muell. ex Benth. subsp. *whitfordii* (Schindl.) H. Ohashi, and *Desmodium strigillosum* Schindl. subsp. *celebicum* (Schindl.) H. Ohashi.

Key words: *Codariocalyx microphyllus*, *Desmodium incanum*, *Desmodium intortum*, Malesia, taxonomy.

Asian *Desmodium* and its related genera have been well studied in recent years. Comprehensive lists or floras of the species in these genera have been compiled for West Asia (Lock and Simpson 1991), Pakistan (as West Pakistan; Ali 1977), India (Sanjappa 1992), Nepal (Ohashi 1979), Bhutan (Grierson and Long 1987), Sri Lanka (Pedley 1996), South Asia (Kumar and Sane 2003), Indo-China (Dy Phon et al. 1994), Indo-China including Thailand (Lock and Heald 1994), China (Ohashi 1995, Yang and Huang 1995), Taiwan (Huang and Ohashi 1993), Japan (Ohashi 2001), and Siberia to Russia Far East (Yakovlev et al. 1996). Malesia is the largest area that has not been treated since Meeuwen (1961, 1962) and Ohashi (1971, 1973). It needs a recent revision.

Malesia was proposed by Zollinger in 1857 as a floristic region (Johns 1995), and is commonly known as the area for the Flora Malesiana (Steenis 1950). It extends eastward from Sumatera (Sumatra), through the

Malay Peninsula, Borneo, Sulawesi (Celebes), Maluku (Moluccas), New Guinea to the Bismarck Islands. To the north it is delimited by Luzon and to the south by Christmas Island. This demarcation of Malesia is adopted here, although a recent redefinition of Malesia (Brummitt 2001) divides it into Malesia in the narrow sense and Papuasia by excluding New Guinea and the Bismarck Archipelago.

This paper aims to enumerate all the known species and infraspecific taxa of *Desmodium* and related genera in Malesia as a precursor to revisions of these genera for Flora Malesiana, and to analyze distribution patterns of the native Malesian taxa, because no such works on distribution have so far been done for these genera.

The paper is divided into two parts. Circumscription of *Desmodium* and its relatives, a taxonomic history of these genera in Malesia and an enumeration including *Aphyllodium*, *Codariocalyx*, *Dendrolobium*, *Desmodiastrum*, and *Desmodium* are treated in this part. Other genera (*Hanslia*, *Hegnera*, *Hylodesmum*, *Monarthrocarpus*, *Ohwia*, *Phyllodium*, *Tadehagi*, and *Trifidacanthus*), phytogeographic considerations and references will be presented in the next part.

Circumscription of *Desmodium* and related genera

Desmodium and related genera belong to the tribe Desmodieae in the subfamily Papilionoideae. Desmodieae are considered to be one of the most highly advanced tribes of the subfamily Papilionoideae (Polhill 1981, Ohashi et al. 1981). "There are high levels of specialisation and diversity with good correlation in a notable range of features to give a rather precise stepwise progression through series, section, subgenus, genus and generic group" (Ohashi et al. 1981). The tribe is divided into two subtribes, i. e., Desmodiinae and Lespedezinae (Ohashi in Lewis et al. in prep.), by removing subtribe Bryinae from the previous Desmodieae to the aeschynomenoid group as indicated by the analysis of the chloroplast gene *rbcL* (Bailey et al. 1997, Doyle et al. 2000).

However, "in practice, the main problem has been the circumscription of *Desmodium* (Ohashi et al. 1981)" for the system of tribe Desmodieae, because "there are overall similarity among the *Desmodium* and its allied genera (Verdcourt 1979)". Both narrower and broader circumscriptions of *Desmodium* have so far been proposed. Bentham (1852, 1865b) faced the problem of circumscription of *Desmodium*. In 1852 he published his first generic system on *Desmodium* and its allied genera. His *Desmodium* was narrower than that of Candolle (1825b, 1826) and Wight and Arnott (1834). He recognized six satellite genera of *Desmodium*, i. e., *Catenaria* Benth., *Dendrolobium* (Wight & Arn.) Benth., *Dicerma* DC., *Ougeinia* Benth., *Phyllodium* Desv. and *Pteroloma* Desv., based on species previously included in *Desmodium*, although he included *Nicolsonia* recognized by Candolle (1825b) in *Desmodium*. This concept was later strengthened by Schindler (1924a, 1924b, 1928). He recognized 15 genera as closely related to *Desmodium*. Schindler's core *Desmodium* (1928) is almost confined to the Old World species excluding almost all the New World species as *Meibomia*. This is the narrowest circumscription of *Desmodium* ever proposed.

In 1865, Bentham (1865b) adopted a new concept of *Desmodium* changing his previous system of *Desmodium* and its allied genera created in 1852. With the exception of *Ougeinia* he united the five remaining genera into *Desmodium*, recognizing them as sections within *Desmodium*. Pedley (1999) explained why Bentham (1865a) changed his concept of *Desmodium* in 'Genera Plantarum'. This is the broadest circumscription of *Desmodium* and this concept was followed

by Baker (1876), Taubert (1894), Merrill (1910, 1923), Schubert (1940, 1971, 1980), Meeuwen (1962), Fosberg (1966), Verdcourt (1979), Sanjappa (1992), and others. Naturally, *Desmodium* in the broad sense contains variously diverse species, and the boundary between *Desmodium* in the broader sense and other genera of Desmodiinae becomes obscure.

A concept intermediate between the broadest *Desmodium* of Bentham (1865b) and the narrowest circumscription of Schindler (1928) was proposed by Ohashi (1973) and was used in Ohashi et al. (1981), Dy Phon et al. (1994), Ohashi (1995), Yang and Huang (1995) and Pedley (1996, 1999). However, in this system "it has the disadvantages that a small number of species are transitional to some degree, and that the difference between some subgenera of *Desmodium* and the segregates are marginal so that stability for the classification is not assured" (Ohashi et al. 1981 on page 293).

All 19 genera in the subtribe Desmodiinae recognized in Ohashi et al. (1981) form a monophyletic group marked by the loss of the chloroplast *rpl2* intron (Bailey et al. 1997). However, previous concepts for *Desmodium* proposed by Bentham (1852, 1965b), Ohashi (1973), Ohashi et al. (1981) are considered to be paraphyletic suggested by results of analyses of the chloroplast gene *rbc*L (Kajita et al. 1996 and in prep.). Also, *Meibomia* proposed by Schindler (1924a) is monophyletic with *Desmodium*. The broadest *Desmodium* is morphologically indistinguishable from the close genera *Alysicarpus*, *Christia*, *Mecopus*, *Ougeinia*, *Pseudarthria* or *Uraria*, due to lack of robust dianostic characters, hence there exist species intermediate between these genera. The present circumscription of *Desmodium* is, therefore, narrower than that of Ohashi (1973) as *Akschindlium* (Ohashi 2003), *Hanslia*, *Hylodesmum* (Ohashi and Mill 2000), *Monarthrocarpus* and *Ohwia* (Ohashi 1999) are here separated as distinct genera (Ohashi in Lewis et al. in prep.).

In the present paper, *Desmodium* and related genera in Malesia are grouped as composing of the following 13 genera, i.e., *Aphyllodium*, *Codariocalyx*, *Dendrolobium*, *Desmodiastrum*, *Desmodium*, *Hanslia*, *Hegnera*, *Hylodesmum*, *Monarthrocarpus*, *Ohwia*, *Phyllodium*, *Tadehagi* and *Trifidacanthus*. Excepting *Desmodiastrum* and *Trifidacanthus*, the other 11 genera were treated as belonging to the members of *Desmodium* and related genera in Ohashi (1973).

History of taxonomic studies on *Desmodium* and related genera in Malesia

The first important contribution to the taxonomy of *Desmodium* and related genera in Malesia was made by Bentham (1852). He classified 21 species from Jawa and Sumatera in the Junghuhn herbarium as follows: *Desmodium* with 15 species, *Dendrolobium* with two species, and one species each in *Catenaria*, *Dicerma*, *Phyllodium* and *Pteroloma*. Merrill (1923) adopting the broadest concept of *Desmodium* (= *Desmodium* s. l.) proposed by Bentham (1865b) recorded 31 species from the Philippines in which 28 are indigenous and three are alien introductions from America, but excluded *Desmodium securiforme* Benth. as a separate genus *Monarthrocarpus* and described a new genus *Trifidacanthus* based on *T. unifoliolatus* Merr. Backer and Bakhuizen van den Brink Jr. (1963) recognized 31 species of *Desmodium* s. l. from Jawa, which is one of the most well botanized areas in Malesia.

The most comprehensive treatment of *Desmodium* s. l. in Malesia was published by Meeuwen (1961, 1962), who treated *Alysicarpus parviflorus* and *Monarthrocarpus* as members of *Desmodium*. She recorded 44 species of which 39 were recog-

nized as correct, three insufficiently known (*D. bolsteri*, *D. uncinatum* and *D. viridiflorum*), one doubtful (*D. frutescens*) and one unidentified. These are 37 species native to Malesia, six introduced from America and one unknown. In his revision of the Asiatic *Desmodium* and its allied genera, adopting a narrower concept of *Desmodium*, Ohashi (1973) treated 36 species from Malesia. He recognized seven genera: *Desmodium* with 26 species, *Dendrolobium* with three species, *Codariocalyx* and *Phyllodium* each with two species, and *Dicerma*, *Hegnera* and *Tadehagi* each with one species. Verdcourt (1979) recognized 33 species in *Desmodium* s. l. from New Guinea, of which 26 were indigenous including four newly recorded taxa: *D. gunnii* Benth. ex Hook., *D. hentyi* Verdc., and *D. rhytidophyllum* F. Muell. ex Benth. and *D. rhytidophyllum* subsp. *acutifoliorum* Verdc. He included an unknown "*Desmodium* species A" in his treatment. Steenis (1978) described one new species of *Desmodium* from the Lesser Sunda Islands, *D. horridum* Steenis, but, this species was regarded as identical with *Trifidacanthus unifoliolatus* Merr. by Dy Phon (1981). *Trifidacanthus* was transferred to *Desmodium* by Steenis (1982), but revived as a distinct genus by Ohashi et al. (1996). Ohashi (1997a) recognized *Dendrolobium arbuscula* (Domin) H. Ohashi which was regarded as *Desmodium quinquepetalum* (Blanco) Merr. by Meeuwen (1962) from New Guinea. Ohashi (1998a) described *Dendrolobium geesinkii* H. Ohashi from the Philippines and Ohashi et al. (1999) reported *Dendrolobium papuacola* H. Ohashi & T. Nemoto from New Guinea.

Pedley (1999) revised Australian species of *Desmodium* and its related genera and recognized five genera with 48 species including eight introduced species in Australia. He clarified Malesian species related to the Australian ones especially *Aphyllodium biarticulatum* (L.) Gagnep. and its allies, *D. filiforme* Zoll. & Moritzi, and *D. pullenii* Pedley. He recorded *D. pullenii* Pedley from Alor in the Lesser Sunda Islands and *D. varians* (Labill.) D. Don from New Guinea.

Identification of the two unknown species recorded by Meeuwen (1962) and Verdcourt (1979) remains problematic. One is an unidentifiable specimen, B. O. van Zanten H.75 (L), from New Guinea recorded by Meeuwen (1962), but Verdcourt (1979) in his Legumes of New Guinea did not mention about this specimen. The other is cited by Verdcourt as "*Desmodium sp. A*" based on a specimen, Conn et al. in LAE 66341. I have examined both specimens; the former was *Desmodium incanum* (G. Mey.) DC., and the latter was *D. sequax* Wall.

Material and Methods

This work is based mainly on herbarium specimens kept in the following herbaria; A & GH, BM, BO, CAL, CAS, E, K, KYO, L, LAE, LD, MO, NY, PNH, S, SING, TI, TNS, TUS, UC, UPS, and US (Herbarium abbreviations see Holmgren et al. 1990). I made field works in Jawa in 1989 and 1996 and Luzon in 1993.

Enumeration of the taxa of *Desmodium* and related genera in Malesia

In the following enumeration, keys to genera, species and infraspecific taxa are provided. Genera are arranged in alphabetical order; species are also listed alphabetically by their specific epithet within each genus, and infraspecific taxa are enumerated, also in the same sequence, after the type taxa for each species. For the species, the correct name, its basyonym if present, and synonyms used in works for the Malesian floras are listed. Bibliographic citation for the species and infraspecific taxa are mostly limited to works published for the Malesiana region. All species recorded in the Malay Peninsula (Ridley 1922), Philippines (Merrill 1923),

Malesia (Meeuwn 1962), Java (Backer and Bakhuizen van den Brink Jr. 1963), and New Guinea (Verdcourt 1979) are cited in this enumeration.

Distribution areas of each species and infraspecific taxa in Asia are arranged from west to east in the following botanical areas W. Asia (as treated in Lock and Simpson 1991), Sri Lanka, India, Myanmar, Thailand, Indo-China (Cambodia, Laos, and Vietnam as treated in Dy Phon et al. 1994), Malesia, China, Taiwan, and East Asia including Japan, Korea and Russia Far East. Malesia is divided into 11 regions in accordance with Hollis and Brummitt (1992), and they are arranged in alphabetical order in this paper as follows: Bismarck Archipelago, Borneo, Christmas Islnd, Jawa, Lesser Sunda Island, Malaya, Maluku (Moluccas), New Guinea, Philippines, Sulawesi, and Sumatera. Borneo includes Brunei, Kalimantan, Sabah and Sarawak; Malaya includes Peninsular Malaysia and Singapore; and New Guinea includes Irian Jaya and Papua New Guinea (Brummitt 2001). Jawa, Maluku, Sulawesi, and Sumatera are used instead of Java, Moluccas, Celebes, and Sumatra, respectively.

Specimens cited here are only those of representative ones.

Key to the genera of *Desmodium* and its relatives in Malesia

1. Flowers one per bract; secondary bracts absent; bracteoles well developed. Inflorescences paniculate or elongate to shortened racemose, often similar to umbellate; hooked hairs absent. Trees, shrubs or rarely subshrubs or herbs; flowers white or pale yellowish..... ..... *Dendrolobium*
1. Flowers usually 2-several per primary bract, each flower subtended by one secondary bract; bracteoles absent or small. Sometimes flowers one per bract and bracteoles absent. Inflorescences pseudopaniculate (= compound pseudoracemose) to pseudoracemose or sometimes racemose; hooked hairs present or absent. Shrubs, subshrubs or herbs, rarely tree; flowers usually pink to purplish red, rarely white to pale yellow ..2
2. Primary bracts foliaceous, with 2 lateral leaflets. Stipules very broadly to depressed triangular with a long-acuminate apex. Shrubs ..... *Phyllodium*
2. Primary bracts simple. Stipules generally narrowly ovate to triangular.....3
3. Stipules united, amplexicaul, apex 3- or more divided. Leaves subdigitately 3-foliolate. Primary bracts similar to the secondary bracts. Pods with 2 suborbicular articles. Pollen grains asymmetric..... *Aphyllodium*
3. Stipules free, apex entire. Leaves pinnately 1, 3, or rarely 5–7-foliolate. Primary bracts different from the secondary bracts. Pods usually with more than 2 articles, articles not orbicular. Pollen grains symmetric.....4
4. Disk present around the base of pistil; pistil stipellate; glandular hairs absent on inflorescence rachis, pedicels or calyx 5
4. Disk absent in flowers; pistil sessile or stipellate; glandular hairs often present on inflorescence rachis, pedicels or calyx 7
5. Stigma lateral. Loment-articles 12–20 mm long. Inflorescences pendulous. Leaves 1-foliolate, without wings along petiole ..... *Hanslia*
5. Stigma terminal. Loment-articles less than 13 mm long. Inflorescences erect or ascending. Leaves 3-foliolate, with wings along the petiole 6
6. Leaves 3-foliolate, with narrow wings along the petiole. Petals white to yellow. Pods sessile, linear, both sutures equally undulate, lateral surfaces without reticulate-veins. Seeds scarcely rim-arillate..... ..... *Ohwia*

6. Leaves 1-foliolate, with distinct wings along petiole. Petals reddish purple. Loments stipitate, narrowly oblong, lower (= abaxial) suture more deeply undulate than the upper, lateral surfaces reticulate-veined. Seeds rim-arillate ..... *Tadehagi*
7. Climbers. Terminal leaflet depressed obovate with an obcordate apex; pods imbricate at joints ..... *Hegnera*
7. Erect shrubs, subshrubs or herbs. Terminal leaflet and pods not as above 8
8. Shrubs with lignified trifid spines derived from an inflorescence axis and two pedicels; leaflets lustrous, coriaceous ..... *Trifidacanthus*
8. Plants without lignified trifid spines.....9
9. Pedicels longer than the flowers or pods, without bracteoles. Calyx glumaceous, much longer than article. Corolla not or shortly exserted from the calyx ..... *Desmodiastrum*
9. Pedicels shorter than the flowers or pods, with or without bracteoles. Calyx scarious, usually shorter than article. Corolla much exserted from the calyx ... .10
10. Fruits dehiscent, dehiscing along lower suture, lateral surfaces not reticulate-veined; seeds conspicuously arillate; leaves 1- and/or 3-foliolate ..... *Codariocalyx*
10. Fruits usually indehiscent or rarely dehiscent along lower suture, lateral surfaces usually reticulate-veined; seeds rim-arillate or scarcely rim-arillate 11
11. Isthmi usually more than 1/3 as broad as pod; pods sessile or stipitae; seeds rim-arillate; bracteoles absent or sometimes present ..... *Desmodium*
11. Pods 1-seeded or isthmi usually less than 1/3 as broad as pod; pods stipitate; seeds scarcely rim-arillate, flat; bracteoles absent 12
12. Loments 1-seeded, articles falcate; seeds transversely narrowly elliptic, with a lateral hilum; calyx distinctly 4-lobed; keel connate to abaxial (lower) side; stamens diadelphous ..... *Monarthrocarpus*
12. Loments usually more than 2-seeded; articles obliquely depressed or very shallowly obtriangular, with a central hilum; calyx shallowly 4-lobed; stamens monadelphous ..... *Hylodesmum*

APHYLLODIUM

Aphyllodium (DC.) Gagnep. in Notul. Syst. (Paris) **3**: 254 (1916) [Type: *Aphyllodium biarticulatum* (L.) Gagnep. (= *Hedysarum biarticulatum* L.)]; Pedley in Rev. Handb. Fl. Ceylon **10**: 106 (1996); H. Ohashi in Taiwania **42**: 142 (1997); Pedley in Austrobaileya **5**: 210 (1999).

Dicerma DC., Prodr. **2**: 339 (1825) & Mém. Lég.: 326 (1826), p. p., incl. sect. Aphyllodium DC. sed excl. sect. Phyllodium (Desv.) DC. [Type: *Dicerma biarticulatum* (L.) DC. (= *Hedysarum biarticulatum* L.)], nom. illegit.; H. Ohashi, Ginkgoana **1**: 251 (1973); H. Ohashi & al. in Adv. Leg. Syst. **1**: 299 (1981); Allen & Allen, Leg.: 235 (1981); Dy Phon in Dy Phon & al., Fl. Camb. Laos Vietn. **27**: 43 (1994); Y. C. Yang & P. H. Huang in Fl. Reipubl. Pop. Sin. **41**: 13 (1995).

Desmodium sect. Dicerma (DC.) Benth. in Benth. & Hook.f., Gen. Pl. **1**: 519 (1865); Taub. in Engl. & Prantl, Nat. Pflanzenfam. III, **3**: 328 (1894).

Desmodium subgen. Dicerma (DC.) Baker in Hook. f., Fl. Brit. Ind. **2**: 163 (1876).

The genus comprises eight species of which three in Malesia.

Key to the species of *Aphyllodium* in Malesia

1. Primary bract shorter than the flowers and pods, 3–4 mm long; bracteoles 2–3 mm long; inflorescences lax flowered; stipules 3 divided at apex, 5–8 mm long; petioles 3–5 mm long; calyx lobes shorter than the tube..... *A. biarticulatum*

1. Primary bract longer than flowers and pods, 16–17 mm long; bracteoles 5–9 mm long; inflorescences densely flowered; stipules 3–7-divided at apex, 15–33 mm long; petioles more than 10 mm long 2
2. Young branches with long ascending fulvous hairs; wings ca. 7 mm long, shorter than the keel; calyx lobes as long as the tube; stipules to 30 mm long..... .....*A. novoguineense*
2. Young branches glabrous or with appressed to ascending white to brown hairs; wings less than 6 mm long, as long as the keel; calyx lobes as long as or longer than the tube; stipules 10–25 mm long .....*A. schindleri*

Aphyllodium biarticulatum (L.) Gagnep. in Notul. Syst. (Paris) **3**: 254 (1916); Pedley in Rev. Handb. Fl. Ceylon **10**: 167 (1996); H. Ohashi in Taiwania **42**: 143 (1997); Pedley in Austrobaileya **5**: 216 (1999).

Hedysarum biarticulatum L., Sp. Pl. 747 (1753). [Type: Herb. Hermann **3**: 15, No. 296 (BM lecto. by Pedley in Turland and Jarvis 1997)].

Dicerma biarticulatum (L.) DC., Prodr. **2**: 339 (1825), nom. illegit.; Schindl. in Repert. Spec. Nov. Regni Veg. **20**: 267 (1924); H. Ohashi in Ginkgoana **1**: 252 (1973).

Desmodium biarticulatum (L.) F. Muell., Fragm. Phyt. Austr. **2**: 121 (1861); Meeuwen in Reinwardtia **6**: 246 (1962); Verdc., Man. New Guinea Leg.: 392 (1979).

Dicerma biarticulatum var. *australiense* Schindl. f. *genuinum* Schindl. in Repert. Spec. Nov. Regni Veg. **20**: 268 (1924) [Type: Bowen River, Bowman 269 (MEL lecto. by Pedley (1999)].

Desmodium biarticulatum var. *australiense* (Schindl.) van Meeuwen in Reinwardtia **6**: 247 (1962).

Dicerma biarticulatum subsp. *australiense* (Schindl.) H. Ohashi in Ginkgoana **1**: 255 (1973), p. p., excl. *Dicerma biarticulatum* var. *australiense* f. *longibracteatum* Schindl. et f. *plumosum* Schindl.

Aphyllodium australiense (Schindl.) H. Ohashi in Taiwania **42**: 143 (1997).

Distr.: Asia and Australia. Asia: Sri Lanka, S. India, Thailand, Indo-China, **Malesia**, and S. China (Hainan).

Specimens examined: **Jawa**. Blume? (GH, L); unknown collector (det. Ind. Kew 1897). (BO); Herb. Reinwardt s. n. (L); DeVriese s. n. anno 1857-1861 (L). **Malaya**. Dungun–K. Terenggunu Rd. Open sandy field, shrub. D. Nrijeer kepong Field No. 94759 (L). **Sulawesi**. Froidevelle 32 (BO, L); Balik Angin. Teysmann 12374 (BO, K, L); Bonko Pasang. Bünnemeyer 10624 (BO, K, L); between Maros and Makassar. Zollinger 3306 (BM, BO); Tata. Noerkas 100 (BO, L). **Sumatera**. Junghuhn 148 (K), DeVriese s. n. (K).

Meeuwen (1962) regarded a specimen of this species in Reinwardt Herbarium in L (probably Reinwardt s. n. or de Vriese s. n. as cited above) labeled "Java" is erroneously localized. Probably she examined only this specimen from Jawa, then she considered this species is not distributed in Jawa. Several other specimens of this species collected in Jawa are available in this study as cited above, although all are old collections and lacking detailed localities. It may be natural to recognize that this species occurs (or occurred) in Jawa. All localities of the species cited above belong to the West and Central Malesian floristic regions (Johns 1995).

Aphyllodium novoguineense (Schindl.) H.Ohashi in Taiwania **42**: 146 (1997), p. p., excl. *Dicerma biarticulatum* var. *australiense* f. *plumosum* Schindl.

Dicerma novoguineense Schindl. in Repert. Spec. Nov. Regni Veg. **20**: 268 (1924) [Type: New Guinea. Astrolabe Range. F. H. Brown 50 (P?)].

Desmodium biarticulatum auct. non (L.) F. Muell.: Verdc., Man. New Guinea Leg.: 392 (1979), p. p.

This species is known only from the type,

which was unavailable for this study. Pedley (1999) considered that this species may be distinct from *A. schindleri* Pedley, *A. glossocarpum* Pedley and *A. biarticulatum* (= *Aphyllodium australiense* (Schindl.) H. Ohashi), but it seems to be similar to *A. latifolium* Pedley and *A. schindleri* in sharing large stipules, leaflets, bracts and bracteoles.

Aphyllodium schindleri Pedley in Austrobaileya **5**: 213 (1999) [Type: Queensland. Cook District: 8 km SW of Beagle North Camp, 13004'S 141045'E, June 1982. J. R. Clarkson 4479 (BRI holo.; iso. BRI, K, NSW)].

Dicerma biarticulatum var. *australiense* f. *longibracteatum* Schindl. in Repert. Spec. Nov. Regni Veg. **20**: 268 (1924) [Type: Carpentaria. Mainland opposite Groote Eylandt, Brown 4183 (isosyn. BM, BRI, K, see Pedley (1999)].

Desmodium biarticulatum var. *australiense* (Schindl.) van Meeuwen in Reinwardtia **6**: 247 (1962), p. p.; Verdc., Man. New Guinea Leg.: 392 (1979), p. p.

Dicerma biarticulatum subsp. *australiense* (Schindl.) H. Ohashi in Ginkgoana **1**: 255 (1973), p. p.

Distr.: **Malesia** (New Guinea) and Australia.

Specimens examined: **New Guinea**. Papua New Guinea. Baroka. Erect undershrub 50–70 cm, grassy savannah forest ridges, standard white; other petals white, tipped with purple. Brass 3721 (A, BM, CAS, K, L, NY, US); Port Moresby. Open savannah-forest; common on stony slopes. Flowers white. Brass 8781 (A, BM, L); Kanosia, open savannah forest. Fls. white. Carr 11153 (BM, K, L, NY); Mesime, open savannah. Gillison 22141 (A, K, L); Road 1 mile E. of Brown R. turn off. Verdcourt & Huxley 4869 (K, L); between Laloki and Hiwick River. Womersley 19094 (A, K, L).

Dicerma biarticulatum var. *australiense* Schindl. was characterized by Schindler (1924) in having the large stipules (to 20 mm long), leaflets (to 40 mm long and 11 mm wide), primary bracts (to 13 mm long) and bracteoles (to 7 mm long). These upper limits of variation ranges in var. *australiense* were exceeding those in *Aphyllodium biarticulatum*. Pedley (1999) clarified var. *australiense* Schindl. as referable to f. *genuinum* Schindl., although it was treated by Meeuwen (1962) and Ohashi (1973) as *D. biarticulatum* f. *longibracteatum* Schindl.

CODARIOCALYX

Codariocalyx Hassk. in Flora **25**(2): Beibl. 48 (1842), p. p., excl. sp. cit. *C. capitatus* (DC.) Hassk. [Type: *Codariocalyx motorius* (Houtt.) H. Ohashi (= *Hedysarum motorium* Houtt.)]; H. Ohashi in Ginkgoana **1**: 40 (1973); H. Ohashi & al. in Adv. Leg. Syst. **1**: 299 (1981); Allen & Allen, Leg.: 174 (1981); Smith, Fl. Vitiensis Nova **3**: 195 (1985); Huang & H. Ohashi, Fl. Taiwan ed. 2, **3**: 215 (1993); Dy Phon in Dy Phon & al., Fl. Camb. Laos Vietn. **27**: 54 (1994); Y. C. Yang & P. H. Huang in Fl. Reipubl. Pop. Sin. **41**: 59 (1995); Pedley, Rev. Hand. Fl. Ceylon **10**: 193 (1996).

The genus comprises three species; all are found in Malesia.

Key to the species of *Codariocalyx* in Malesia

1. Terminal leaflet less than 2.5 cm long; inflorescences racemose, usually 3–10-flowered, lax; flowers one per node; calyx 5-lobed, lobes narrowly triangular, upper lobes connate at base..... .....*C. microphyllus*
1. Terminal leaflet usually more than 3 cm long; inflorescences pseudoracemose, densely flowered; flowers 2 or 3 per node; calyx 4-lobed, lobes shallowly triangular, upper lobes connate almost to apex 2
2. Terminal leaflet obovate, broadly elliptic or broadly obovate, apex obtuse, rounded or emarginate, upper surfaces appressed hairy. Pods with long-pilose and short hooked hairs.....*C. gyroides*

2. Terminal leaflet narrowly ovate, apex acute or sometimes obtuse, upper surfaces minute hairy but afterward glabrescent. Pods with hooked hairs ....*C. motorius*

Codariocalyx gyroides (DC.) Hassk. in Flora **25**(2): Beibl. 49 (1842), p. min. p.; H. Ohashi in Ginkgoana **1**: 43 (1973); Smith, Fl. Vitiensis Nova **3**: 190 (1985).

Desmodium gyroides DC., Prodr. **2**: 326 (1825) [Type: "India orient. ad Silhet." in Roxb., Hort. Beng. 57 (1814)], & Mém. Lég. 322 (1826); Ridl., Fl. Malay Penins. **1**: 611 (1922); Merr., Enum. Philipp. Flow. Pl. **2**: 285 (1923); Meeuwen in Reinwardtia **6**: 250 (1962); Backer & Bakh. f., Fl. Java **1**: 605 (1963); Verdc., Man. New Guinea Leg.: 398 (1979).

Desmodium pseudogyroides Miq., Fl. Ned. Ind. **1**(1): 244 (1855) [Type: Jawa. jij Banjoemas, door Dr. Th. Horsfield ontdekt. (n. v.)].

Desmodium papuanum C.T.White in Proc. Roy. Soc. Queensl. **34**: 34 (1922) [Type: Papua. Astrolabe Range. Stephansort, bei Erima am Strande, Lewandowsky 62, 20 Aug. 1899 (BRI holo.; iso. K)].

Distr.: India, Myanmar, Thailand, Indo-China, **Malesia**, and S. China. Previous records from Sri Lanka are based on a cultivated plant (Pedley 1996).

Specimens examined: **Borneo**. Sarawak. Bakelalan. Brooke 10345 (BM); Penampang. Tandom B.N.B. For. Dep. 2818 (A). **Jawa**. Horsfield s. n. (BM), Ridley in 1915 (BM); Zollinger 299 (L); Junghuhn 161 (L); Reinwardt (L 908.115–1306). **Malaya** (fide Meeuwen 1962). **New Guinea**. Papua New Guinea. Near Naukwate village. Hoogland 4145 (A, BM); Menapi, Cape Vogel Peninsula. Brass 21802 (A, US); Road from Wau to Kauli Creek. van Royen 106307 (A, K, L, US). **Philippines**. Mindanao. Elmer 10509 (BM) & 10954 (BM). **Sulawesi** (fide Meeuwen 1962). **Sumatera**. Asahan. Bartlett & Rue 189 (A); Atjeh. Steenis 8824 (A), Korthals s. n. (A, NY); Near Redelong. Bangham 912 (A).

Codariocalyx microphyllus (Thunb.) H. Ohashi, comb. nov.

Hedysarum microphyllum Thunb. in Murray, Syst. Veg. ed. 14, 675 (1784) & Fl. Jap.: 284 (1784) [Type: Japonia. Thunberg (UPS)].

Desmodium parvifolium DC. in Ann. Sci. Nat. 4: 100 (1825) [Type: Napaulia. Wallich (G-DC, holo.)]; Benth. in Miq., Pl. Jungh.: 223 (1852).

Desmodium microphyllum (Thunb.) DC., Prodr. **2**: 337 (1825); Miq., Fl. Ned. Ind. **1**(1): 239 (1855); Merr., Enum. Philipp. Flow. Pl. **2**: 287 (1923); Meeuwen in Reinwardtia **6**: 254 (1962); Backer & Bakh. f., Fl. Java **1**: 609 (1963); H. Ohashi in Ginkgoana **1**: 241 (1973); Verdc., Man. New Guinea Leg.: 402 (1979); H. Ohashi in J. Jpn. Bot. **59**: 45 (1984); Pedley in Austrobaileya **5**: 235 (1999).

Distr.: Asia and Australia (Queensland and Arnhem Land). Asia: Sri Lanka, India, Myanmar, Thailand, Indo-China, **Malesia** (throughout), China, Taiwan, and Japan.

This species is similar to members of sect. Sagotia of *Desmodium*, especially *D. heterophyllum* and *D. auricomum*, in the shape of the calyx, the small flowers and inflorescence structure. Pedley (1999) created the monotypic series, ser. Arillata, to accomodate this species in subgen. Sagotia of *Desmodium* based on its unique, arillate seeds. However, it is distinct from *Desmodium* not only in arillate seeds but also in the shape of the petals, dehiscent legumes, variation in leaflet number and pollen wall stratification. In these latter characters *Codariocalyx microphyllus* are common with the other two species of the genus.

Codariocalyx motorius (Houtt.) H. Ohashi in J. Jpn. Bot. **40**: 367 (1965) & in Ginkgoana **1**: 46 (1973).

Hedysarum motorium Houtt., Nat. Hist. II, **10**: 246 (1779) [Type: Cult. at Leiden, Sept. 1778. A specimen of Van Royen is in L. (L 908.115–344)].

Hedysarum gyrans L. f., Suppl.: 332 (1782) [Type: Cult. Upsala from seeds sent by Forster in 1778 (fide Merrill in J. Arn. Arb. **19**: 346. 1938)].

Desmodium gyrans (L. f.) DC., Prodr. **2**: 326 (1825); Merr., Enum. Philipp. Flow. Pl. **2**: 285 (1923).

Codariocalyx gyrans (L. f.) Hassk. in Flora **25**(2) Beibl.: 49 (1842).

Desmodium motorium (Houtt.) Merr. in J. Arn. Arb. **19**: 345 (1938): Meeuwen in Reinwardtia **6**: 254 (1962); Backer & Bakh. f., Fl. Java **1**: 605 (1963).

Distr.: Sri Lanka, India, Thailand, Indo-China, **Malesia** (Jawa, Lesser Sunda Is: Sumba, Timor, and Wetar, Philippines, Sulawesi, and Sumatera), S. China and Taiwan.

Specimens examined: **Jawa**. Horsfield s.n. (A, BM) & Horsfield L.18 (A), Zollinger 1569 (A, BM), 2218 (BM); Warburg 11233 (NY). **Philippines**. Cuming 1338 (BM), 1619 (BM). Luzon. Williams 1407 (US), Merrill 4277 (US). Mindanao. Elmer 11092 (BM, US); Ramos & Edano Bur. Sci. 38477 (US).

Codariocalyx gyroides is common in New Guinea, but *C. motorius* is not found there.

DENDROLOBIUM

Dendrolobium (Wight & Arn.) Benth. in Miq., Pl. Jungh.: 215 & 216 (1852), as "*Dendrolobium* Wight & Arn."; H. Ohashi in Ginkgoana **1**: 50 (1973); H. Ohashi & al. in Adv. Leg. Syst. **1**: 299 (1981); Allen & Allen, Leg.: 223 (1981); Smith, Fl. Vitiensis Nova **3**: 185 (1985); Huang & H. Ohashi, Fl. Taiwan ed. 2, **3**: 242 (1993); Dy Phon in Dy Phon & al., Fl. Camb. Laos Vietn. **27**: 8 (1994); Y. C. Yang & P. H. Huang in Fl. Reipubl. Pop. Sin. **41**: 3 (1995); Pedley, Rev. Hand. Fl. Ceylon **10**: 162 (1996); H. Ohashi in J. Jpn. Bot. **73**: 249 (1998) & in Sci. Rep. Tohoku Univ. ser. 4, Biol. **40**: 229 (1999); Pedley in Austrobaileya **5**: 219 (1999).

Desmodium subgen. Dendrolobium Wight et Arn., Prodr. Fl. Ind. Orient.: **1**: 223 (1834) [Type: *Desmodium umbellatum* (L.) DC. (= *Hedysarum umbellatum* L.)].

The genus comprises 19 species of which eight are found in Malesia.

Key to the species of *Dendrolobium* in Malesia

1. Leaflets densely appressed silver-gray-sericeous on principal nerves on abaxial surface. Lowest calyx-lobe ca. 3 times longer than the lateral lobe. Young branches sharply 3-angular, densely sericeous on the angles. Loments entirely covered with silver-gray-sericeous ..... *Dendr. triangulare*
1. Leaflets without silver-gray silky hairs on principal nerves on abaxial surface. Lowest calyx-lobe equal to or less than 2 times longer than the lateral lobe. Young branches terete, pubescent or sericeous. Loments puberulent and glabrescent or yellowish or brown sericeous 2
2. Inflorescences axillary from axils of lower few nodes of new branches, umbellate with (1–)2 flowers. Peduncles of umbels ca. 2 mm long. Leaflets with conspicuous lateral nerves .... *Dendr. geesinkii*
2. Inflorescences terminal or axillary from axils of upper nodes of branches, umbellate or shortened racemose with more than 6 flowers. Peduncles of umbels more than 10 mm long. Leaflets with conspicuous or inconspicuous lateral nerves 3
3. Terminal leaflet rhombic, obovate or broadly obovate, apex rounded or shortly acute. Fruits moniliform, both sutures undulate ..... *Dendr. rugosum*
3. Terminal leaflet not as above, apex obtuse to acuminate. Fruits compressed or slightly moniliform, upper sutures straight or slightly undulate 4
4. Leaflets acuminate at apex; lateral nerves distinct on lower surfaces; terminal leaflet narrowly elliptic-ovate to ovate or rarely broadly ovate. Inflore-

scences paniculate or compound racemose with one umbel at each node, sometimes simply umbellate. Mature loments densely appressed yellowish sericeous..... *Dendr. quinquepetalum*

4. Leaflets obtuse or acute at apex; lateral nerves usually indistinct on lower surfaces; terminal leaflet obovate to elliptic or narrowly elliptic. Inflorescences simple or rarely compound, umbellate or rarely compound-racemose with one umbel at each node. Mature loments glabrescent.....5
5. Terminal leaflet shorter than 3 cm, acute at apex; lateral calyx-lobes shorter than the tube; wings shorter than the keel. Articles ca. 5 mm long, 4 mm wide..... .....*Dendr. cumingianum*
5. Terminal leaflet longer than 3 cm, obtuse to rounded or sometimes acute at apex; lateral calyx-lobes not shorter than the tube; wings not shorter than the keel...6
6. Calyx ca. 6 mm long, lateral lobes as long as the tube and shorter than the lowest lobe; leaves puberulent or rarely pubescent on lower surfaces, the terminal leaflet usually shorter than 6 cm long; wings longer than the keel. Pods (1–)3–4-jointed, with persistent calyx at base .....*Dendr. arbuscula*
6. Calyx 4–5 mm long, lateral lobes longer than the tube and as long as the lowest lobe; leaves densely appressed pubescent or sericeous on lower surfaces, the terminal leaflet longer than 5 cm long; wings as long as but smaller than the keel. Pods 3–8-jointed, without calyx at base ....*Dendr. umbellatum*

Dendrolobium arbuscula (Domin) H. Ohashi in Taiwania **42**: 137 (1997); H. Ohashi, Ye & Nemoto in J. Jpn. Bot. **74**: 17 (1999); Pedley in Austrobaileya **5**: 213 (1999).

Desmodium arbuscula Domin in Biblioth. Bot. **89**: 211 (1926) [Type: Nord-Queensland: in der Umgebung von Chillagoe als kleiner Baum oder großer. Strauch, ser häufig in den Savannenwäldern, aber stellenweise auch auf den Felsen; sbenso bei Mungana. Domin, Feb. 1910 (PR527346, lecto., see Pedley 1999)].

Desmodium quinquepetalum auct. non (Blanco) Merr.: Meeuwen in Reinwardtia **6**: 256 (1962), p. p., incl. specim. cit. ex New Guinea & Australia.

Distr.: **Malesia** (common in New Guinea), N. Australia (Queensland) and Fiji.

Specimens examined: **New Guinea**. Papua New Guinea. On the road from Port Moresby to Rigo, between Gaire Beach and the turn-off to Barakan, about 25 km SE of Port Moresby. Bushes with white flowers. Baltisberger & al. 11807 (L); Near Port Moresby, Rouna Rd. Barrett NGF4228 (K, L, SING; photo TUS); Budatobara, riverside, alt. 300 ft. Tree 10–15 ft., flowers white. 4.12.1925. Brass 763 (K); Kappja kappa, coast brushes. Spreading tree, to 20 ft. Flowers white. Brass 783 (K); Loloki River, samall tree on river banks. 17 June 1926. Brass 1654 (K); Port Moresby. Brass 8789 (K, L; photo TUS); Yule Island, on rocky cliffs above sea, alt. c. 30 ft. Shrub c.5 ft tall, flowers white. Darbyshire 745 (K, L); Port Moresby. Carr 11845 (BM, K, L, SING; photo TUS); Motupore, Bootless Inlet, alt. 1 m. Frodin 5203 (L); Moitaka, Central District. Gillison 22131 (K, L); S. coast near Kwikila, crest of limestone hill, Rigo Subdistrict. alt. 100 ft. Paijmans 848 (L); Tovobanda Hills, monsoon forest margin, alt. c. 600 ft. Tree 42 ft. tall, flowers white, wings and keel of equal length. 16.5.1967. Pullen 6992 (K); Rouku, Porebada Road near Waigani Junction. Roadside savannah close to sea. Pulsford UPNG.170 (L); Kapa kapa, eucalypt savannah, alt. c. 50 ft. Schodde 2781 (K, L); Near Busu River near Lae. White T. N. G. 9551 (L).

It becomes clear that this species is very common in New Guinea. Barrett NGF 4228 (L) was named *Dendrolobium quinquepetalum* or *D. umbellatum*, but differs from the former by obtuse leaflets and from the latter in having smaller leaflets (Fig. 1).

Dendrolobium cumingianum Benth. in Miq., Pl. Jungh.: 216 (1852) [Type: Insulae Philippinae. Prov. Batangas. Cuming 1454 (K holo.; iso. BM, K, L, UPS)]; Schindl. in

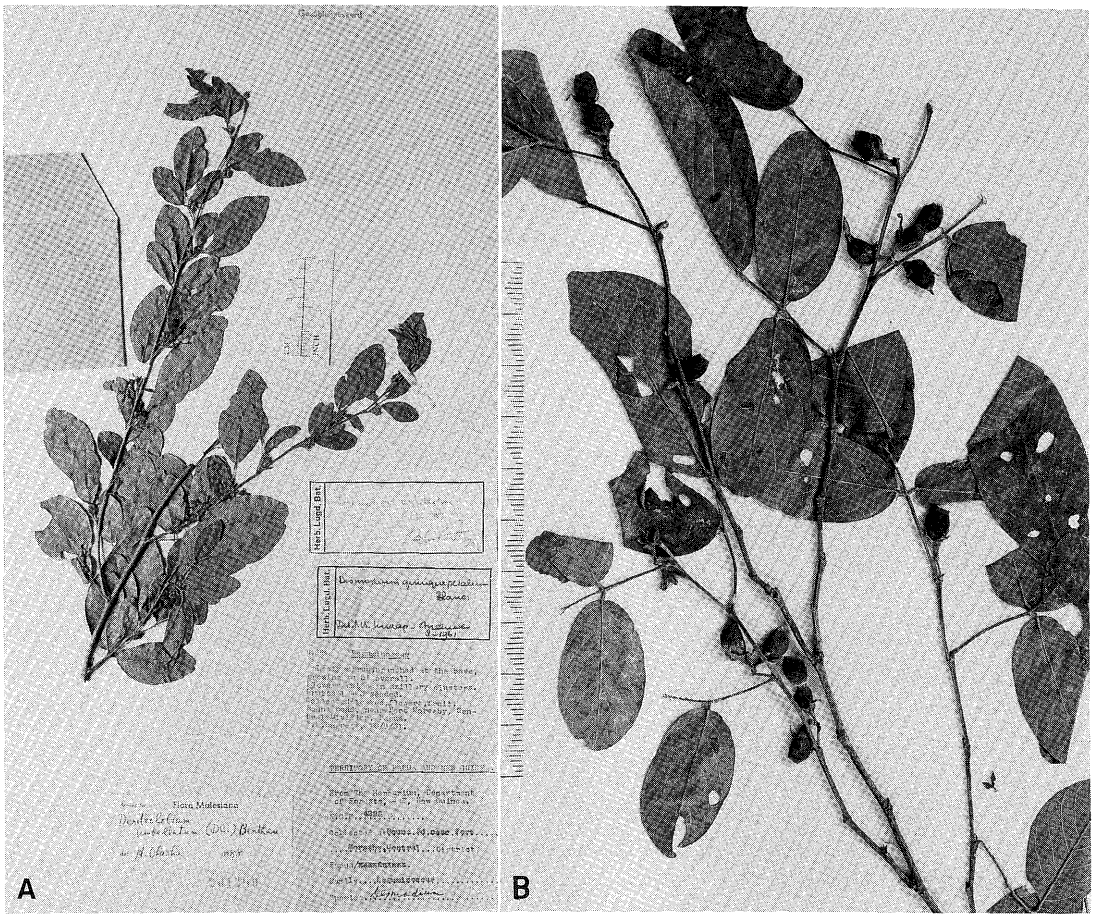

Fig. 1. *Dendrolobium arbuscula* (Domin) H.Ohashi. A: Papua New Guinea. Barrett 4228 (L, cited in H. Ohashi 1997). B: Australia. Queensland. Clarkson 2228 (K).

Repert. Spec. Nov. Regni Veg. **20**: 278 (1924); H. Ohashi in Taiwania **42**: 150 (1997) & in J. Jpn. Bot. **73**: 250 (1998).

Desmodium cumingianum (Benth.) Benth. ex F-Villar, Noviss. App. Fl. Philipp.: 61 (1880); Merr. in Philipp. J. Sci., C. **5**: 80 (1910) & Enum. Philipp. Flow. Pl. **2**: 284 (1923).

Desmodium umbellatum auct. non (L.) DC.: Meeuwen in Reinwardtia **6**: 263 (1962), p. min. p., incl. syn. *Dendrolobium cumingianum* & *Desmodium cumingianum*.

Dendrolobium umbellatum auct. non (L.) Benth.: H. Ohashi in Ginkgoana **1**: 82 (1973), p. min. p., incl. syn. *Dendrolobium cumingianum* & *Desmodium cumingianum*.

Distr.: **Malesia**: endemic to the Philippines (Luzon).

Specimens examined: Philippines. Luzon. Batangas. M. Ramos Bur.Sci. 22341 (A, BM, CAL, L, MO, NY); Ridsdale & Reynoso (= Ridsdale 1857 & 1857A) (A, L).

Dendrolobium geesinkii H. Ohashi in J. Jpn. Bot. **73**: 251, figs. 1 & 2 (1998) [Type: Philippines. Luzon. Zambales. Acoje Mine

concession area, Santa Curz, c. 15.46′N, 120.00′E. 26 May 1986. Ridsdale & Reynoso (= Ridsdale 1554) (L holo.; iso. BO, K, L, MO, PNH, TUS)].

Distr.: **Malesia**: endemic to the Philippines (Luzon Island).

Specimens examined: **Philippines**. The type above; Zambales. Acoje Mine concession area, Santa Curz, c. 15.46′N, 120.00′E. alt. low elevation, May 26, 1986. Shrub 2 m. Flowers creamy white. Only one shrub seen flowering. May 26, 1986. Ridsdale 1554A (L, PNH).

Dendrolobium papuacola H. Ohashi & T.Nemoto in J. Jpn. Bot. **74**: 16, figs. 1–2 (1999) [Type: Papua New Guinea. Loloki River. Brass 1654 (A holo., photo in TUS; K iso.)].

Distr.: **Malesia**, endemic to Papua New Guinea.

Specimen examined: Only the type.

Dendrolobium quinquepetalum (Blanco) Schindl. in Repert. Spec. Nov. Regni Veg. **20**: 278 (1924); H. Ohashi in Ginkgoana **1**: 68 (1973), in Taiwania **42**: 138 (1997) & in J. Jpn. Bot. **73**: 254 (1998).

Cytisus quinquepetalus Blanco, Fl. Filip.: 598 (1837).

Desmodium quinquepetalum (Blanco) Merr. in Bur. Govt. Lab. Manila Publ. **35**: 20 (1905); Merr., Enum. Philipp. Flow. Pl. **2**: 288 (1923); Meeuwen in Reinwardtia **6**: 256 (1962), p. p., excl. specim. cit. ex New Guinea & Australia.

Distr.: **Malesia**, endemic to the Philippines (Bataan, common in Luzon, and Mindoro).

Specimens examined: **Philippines**. Cuming 728 (BM, K). **Bataan**. Balanga. Plant 3–4 m tall. Banzon 1 (L; photo TUS). **Luzon**. Batangas. Ramos & Deroy Bur.Sci. 22662 (A, K, SING, US); Bosobaso. Ramos Bur.Sci. 1498 (GH, NY, US); Bulacan. Ridsdale 1884 (A, K, L, MO, TUS); Raznos, Sp. Blanco. 571 (BM, CAL, CAS, L, US). Masambong. Merrill, Sp. Blanco. 571 (BM, CAS, NY); Mt. San Isidro. Fenix Bur.Sci. 29888 (BM, GH). San Mateo. Ahern's collector For. Bur. 1841 (K, NY, SING, US). **Mindoro**. Ebalo 326 (PNH 57451).

This species is widely distributed in Luzon at low and medium altitudes in open thickets (Merrill 1910). Meeuwen (1962) recorded this species from New Guinea and Australia, but those records are *Dendrolobium arbuscula* (Domin) H. Ohashi (Ohashi 1997).

Dendrolobium rugosum (Prain) Schindl. in Repert. Spec. Nov. Regni Veg. **20**: 279 (1924); H. Ohashi in Ginkgoana **1**: 72 (1973).

Desmodium rugosum Prain in J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. **66**: 137 (1897); Ridl., Fl. Malay Pen. **1**: 607 (1922).

Distr.: Myanmar, Thailand, Indo-China, **Malesia** (Malaya) and China (Yunnan).

Specimen examined: **Malaya**. Peninsula Malaysia. Langkawi, on limestone. Corner SF37833 (BM).

Dendrolobium triangulare (Retz.) Schindl. in Repert. Spec. Nov. Regni Veg. **20**: 279 (1924); H. Ohashi in Ginkgoana **1**: 77 (1973).

Hedysarum triangulare Retz., Observ. Bot. **3**: 40 (1783) [Type: Java. Thunberg (LD)] (Fig. 2).

Hedysarum cephalotes Roxb., [Hort. Beng. 57 (1814), nom. nud.] Fl. Ind. ed. 2, **3**: 360 (1832).

Desmodium cephalotes (Roxb.) Wight & Arn., Prodr. Fl. Ind. Orient.: 224 (1834).

Dendrolobium cephalotes (Roxb.) Benth. in Miq., Pl. Jungh.: 216, 218 (1852).

Desmodium triangulare (Retz.) Merr. in J. Arn. Arb. **23**: 170 (1942); Meeuwen in Reinwardtia **6**: 261 (1962); Backer & Bakh. f., Fl. Java **1**: 603 (1963).

Distr.: Africa and Asia. Asia: Sri Lanka, India, Myanmar, Thailand, Indo-China, **Malesia** (Borneo, Jawa, Lesser Sunda Is., and Sulawesi; absent in New Guinea), S. China, and Taiwan.

Specimens examined: **Jawa**. Thunberg (LD holo. of *Hedysarum triangulare* Retz.); Junghuhn s. n. (BM),

Fig. 2. Holotype of *Hedysarum triangulare* Retz. (LD).

Zollinger 99 (BM), Horsfield 54a (BM); Dago. Holstvoogd 324 (A). Bali. Banjupoh. Dilmy 1062 (A). **Lesser Sunda Is.** Sumba. Wiriadinata 466 (A, BO, US); Timor. Forbes 4011 (BM); Bloembugen 3347 (A). **Sulawesi**. Kjellberg 4116 (NY).

The holotype of *Hedysarum triangulare* Retz. is present in LD. (Fig. 1).

Bentham (1852) listed "*Desmodium recurvatum* Grah.–Wight & Arn. Prodr. v. 1. p. 226" with a specimen, "Java prope Palimanan. Jungh." on page 228, but is referable to *Dendrolobium triangulare* (Schindler 1928; Ohashi 1973). *Desmodium recurvatum*

Grah. ex Wight & Arn. is a synonym of *Desmodium laxiflorum* DC. (Ohashi 1973). *Dendrolobium triangulare* and *Desmodium laxiflorum* are similar to each other in having acuminate, ovate or elliptic terminal leaflets.

Dendrolobium umbellatum (L.) Benth. in Miq., Pl. Jungh.: 216 & 218 (1852); H. Ohashi in Ginkgoana **1**: 82 (1973); Smith, Fl. Vitiensis Nova **3**: 186, fig. 39 (1985); H. Ohashi in Taiwania **42**: 139 (1997) & in J. Jpn. Bot. **73**: 255 (1998); H. Ohashi & al. in J. Jpn. Bot. **74**: 22 (1999); Pedley in Austrobaileya **5**: 223 (1999).

Hedysarum umbellatum L., Sp. Pl.: 747 (1753) [Type: Herb. Hermann vol. 2 fol. 26, No.293 (BM lecto. by Pedley in Turland and Jarvis 1997)].

Hedysarum australe Willd., Sp. Pl. **3**(2): 1183 (1802) [Type: insula Tanna et Nova Caledonia. (B-Willd., microfiche TI)].

Desmodium umbellatum (L.) DC., Prodr. **2**: 325 (1825); Ridl., Fl. Malay Penins. **1**: 611 (1922); Merr., Enum. Philipp. Flow. Pl. **2**: 230 (1923); Meeuwen in Reinwardtia **6**: 263 (1962); Backer & Bakh. f., Fl. Java **1**: 603 (1963); Verdc., Man. New Guinea Leg.: 410 (1979).

Desmodium australe (Willd.) DC., Prodr. **2**: 326 (1825).

Aeschinomene arborea Blanco, Fl. Filip. 581 (1837), ut "*Aeschinamene*."

Dendrolobium australe (Willd.) Benth. in Miq., Pl. Jungh.: 216 (1852).

Dendrolobium umbellatum (L.) Benth. var. *majus* Miq., Fl. Ned. Ind. **1**(1): 262 (1855).

Dendrolobium umbellatum (L.) Benth. var. *obtusissimum* Blune ex Miq., Fl. Ned. Ind. **1**(1): 262 (1855).

Distr.: Africa, Asia, Australia (Queensland) and Pacific. Asia: Sri Lanka, India, Myanmar, Thailand, Indo-China, **Malesia** (throughout), China, Taiwan, and S. Japan (Ryukyu).

Specimens examined: **Borneo**. Agong-agong, seashore. Balajadia 3339 (K); Sarawak. Telok Lakei. Purseglove P.5016 (K). **Jawa**. Junghuhn s. n. (BM); Poeger. Backer 19064 (K). **Lesser Sunda Isands**. Alor. Jaag 520 (BM, L). **Malaya**: Peninsula Malaysia. Pahang. Henderson 22750 (BM); Singapore. Wallich 5687A (BM). **Maluku**. Aroe Island. Buwalda 5143 (K); Buru. Mogea 5357 (BO, K, L). **New Guinea**. Papua. Brass 6413 (A, BM); Irian Jaya. Senggo. Widjaja & al. EW6079 (K); Sorong. van Royen 3105 (K). **Philippines**. Basilan. Reillo Bur. Sci. 16314 (CAS, K, L, US). Luzon. Ahern's collector 141 (A, CAS, UC, US). Mindanao. Elmer 11983 (A, GH, K, US). Mindoro. Merrill 2257 (A, K, US). Palawan. Cenabra F.B.29953 (UC). **Sulawesi**. Banggi Island. Muat & al. 1525 (K). **Sumatera**. Bangka. Horsfield s. n. (BM); Siberut Island. Boden-Kloss 14531 (K).

DESMODIASTRUM

Desmodiastrum (Prain) A. Pramanik & Thoth. in J. Ind. Bot. Soc. **65**: 374 (1986) [Type: *Desmodiastrum racemosum* (Benth.) A. Pramanik & Thoth. (= *Alysicarpus racemosum* Benth.)].

Alysicarpus [unranked] Desmodiastrum Prain in J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. **66**: 385 (1897). Pramanik and Thothathri (1986) regarded the rank as subgenus.

Desmodiastrum was recognized by Pramanik and Thothathri (1986) as a distinct genus. Species of this genus have been considered to be transitional between *Alysicarpus* and *Desmodium* as pointed out by Ohashi et al. (1981). *Desmodiastrum parviflorum* was described under *Alysicarpus* (Dalzell 1851), but have often been recognized under *Desmodium* (Baker 1876, Meeuwen 1962, Sanjappa 1992). *Desmodiastrum* has mostly 3-foliolate leaves, while *Alysicarpus* has 1-foliolate leaves. In addition, Nemoto and Ohashi (2003) clarified fundamental differences in pericarp and joint structures between the two genera.

The genus comprises four species of which one is found in Malesia.

Desmodiastrum parviflorum (Dalz.) H. Ohashi, stat. nov.

Alysicarpus parviflorus Dalz. in Hook., Lond. J. Bot. **3**: 211 (1851), as "*Alyssicarpus*" [Type: India. Concan. Regio trop. Stooks s. n. (K)]; Prain in J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. **66**: 385 (1897).

Desmodium alysicarpoides van Meeuwen in Reinwardtia **6**: 246 (1962) [new name instead of *Desmodium parviflorum* Mart. & Galeotti]; Backer & Bakh. f., Fl. Java **1**: 609 (1963).

Desmodium parviflorum (Dalz.) Baker in Hook. f., Fl. Brit. Ind. **2**: 172 (1876), non Mart. & Galeotti (1843).

Desmodiastrum racemosum (Benth.) A. Pramanik & Thoth. var. *parviflorum* (Dalz.) A. Pramanik & Thoth. in J. Ind. Bot. Soc. **65**: 376 (1986).

Distr.: India and **Malesia** (E. Jawa).

Specimens examined: **Jawa**: Besocki, Mt. Idjen. C. A. Backer 25074 (BO, K, L); Paedjan, alt. 1200 m. Ultee 185 (BO).

This species differs clearly from *Desmodiastrum racemosum* (Benth.) A. Pramanik & Thoth. in inflorescences, pods and habit, hence I regard it as a distinct species.

DESMODIUM

Desmodium Desv. in J. Bot. Agric. **1**: 122, t. 5 (1813), nom. cons. [Type: *Desmodium scorpiurus* (Sw.) Desv. (= *Hedysarum scorpiurus* Sw.), type cons.]; DC., Prodr. **2**: 325 (1825); Benth. in Miq., Pl. Jungh.: 220 (1852); Backer & Bakh. f., Fl. Java **1**: 602 (1963), p. p.; H. Ohashi in Ginkgoana **1**: 87 (1973); Huang & H. Ohashi in Fl. Taiwan **3**: 254 (1977); Verdc., Man. New Guinea Leg.: 385 (1979), p. p.; H. Ohashi & al. in Adv. Leg. Syst. **1**: 299 (1981); Allen & Allen, Leg.: 228 (1981); H. Ohashi in J. Jpn. Bot. **57**: 226 (1982); Smith, Fl. Vitiensis Nova **3**: 188 (1985); H. Ohashi in Sci. Rep. Tohoku Univ. ser. 4, Biol. **39**: 172 (1988); Sanjappa, Leg. India: 149 (1992), p. p.; Huang & H. Ohashi in Fl. Taiwan ed. 2, **3**: 251 (1993); H. Ohashi in Dy Phon & al., Fl. Camb. Laos Vietn. **27**: 62 (1994); Pedley in Rev. Handb. Fl. Ceylon **10**: 169 (1995); Y. C. Yang & P. H. Huang in Fl. Reipubl. Popul. Sin. **41**: 14 (1995); H. Ohashi in Sci. Rep. Tohoku Univ. ser. 4, Biol. **40**: 231 (1999); Pedley in Austrobaileya **5**: 225 (1999).

The genus comprises ca. 300 species of which 36 are found in Malesia: 28 indigenous and 8 introduced. Native and introduced species are enumerated separately in this list.

Key to the species of *Desmodium*

1. Inflorescences copiously branched, paniculate. Secondary bracts usually present. Bracteoles present (in Malesian spp.). Flowers usually more than 7 mm long; wings usually longer, or sometimes shorter, than the keel-petals. Calyx 4-lobed; upper (adaxial) lobe entire or minutely 2-toothed at tip. Stamens monadelphous. Loments more than 5-articulate. Shrubs or trees.....2
1. Inflorescences simple or more or less branched, sometimes paniculate. Secondary bracts absent or present. Bracteoles absent. Flowers usually less than 7 mm long; wings usually not longer than the keel-petals. Calyx 4- or 5-lobed, when 4-lobed upper (adaxial) lobe bifid or 2-toothed at tip. Stamens usually diadelphous, rarely monadelphous. Herbs, subshrubs or shrubs 3
2. Loments nearly moniliform, with (6–)8–13-articles, 2.5–3.5 mm wide, both sutures nearly equally indented, densely with ferrugineous or brown spreading hooked hairs. Calyx-lobes nearly same length and the upper lobe distinctly bifid at apex. Stipules linear. Terminal leaflet rhomboid, obtrullate or often ovate, with undulate or coarsely crenate to sublobate margin .....*D. sequax*

2. Loments flat, less than 8-articles, more than 3.5 mm wide, the lower suture more deeply indented than the upper one, without such hairs as above. Calyx-lobes not same length and the upper lobe entire or minutely bifid at apex. Stipules triangular or narrowly ovate to ovate ..... *D. megaphyllum*
3. Secondary bracts present 4
3. Secondary bracts absent 21
4. Leaflets broader than long, reniform or depressed obovate; calyx-lobes shorter than the tube, upper 2 lobes connate to apex ..... *D. renifolium*
4. Leaflets longer than broad; calyx-lobes not shorter than the tube, upper 2 lobes connate at base and usually bifid or rarely entire at apex 5
5. Stipules auriculate at base and/or often connate on the opposite side of stem from the petiole, persistent..... 6
5. Stipules not auriculate at base, free, usually deciduous 9
6. Lower (abaxial) suture deeply concave than upper suture between the article; leaves 3(–5)-foliolate; plants often bluish-black when dry..... *D. brachypodum*
6. Both sutures equally concave between the article 7
7. Articles narrowly elliptic, 4–5 mm long, 1.5 mm wide; seeds rectangular..... *D. scorpiurus*
7. Articles broadly elliptic to orbicular or rhombic, less than 4 mm long, more than 2 mm wide 8
8. Loments straight; shallowly indented between articles. Principal lateral nerves of leaflets prominent and parallel on lower surface and reaching the margin..... *D. dichotomum*
8. Loments twisted at least when young; deeply indented between articles. Principal lateral nerves of leaflets not as above and looped within the margin ... 9
9. Leaflets thinner, not prominently reticulate; procumbent herb .... *D. procumbens*
9. Leaflets thick and with prominent reticulate venation; shrub or subshrub ..... *D. tortuosum*
10. Loments linear; articles narrowly oblong or narrowly elliptic, both sutures almost equally concave at isthmi or lower suture concave a little deeper than the upper.... 11
10. Loments narrowly oblong; articles not as above, mostly semielliptic to semi-orbicular or obtusely triangular, lower (abaxial) suture concave, deeper than the upper at isthmi 14
11. Leaves 3-foliolate or 3- and 1-foliolate; loments compressed, 5–10-jointed, sessile; articles 4–5.5 × 1–2 mm in size; seeds transversely elliptic, 1–1.1 × 2.1–2.3 mm in size 12
11. Leaves 1-foliolate, only rarely 1- and 3-foliolate 13
12. Loments smooth to more or less rough on lateral surfaces, obliquely jointed; hilum of seeds ca. 0.15 mm long. Prostrate or ascending subshrubs; leaves 3(–1)- or occasionally 1–3-foliolate; terminal leaflet ovate to sometimes broadly ovate, obtuse or acute at apex, 2.5–11 cm long and 1.5–6 cm wide ..... *D. diffusum*
12. Loments striate-veined on lateral surfaces, vertically jointed. Hilum of seeds ca. 0.3 mm long. Erect or ascending shrubs or subshrubs; leaves 3- or 3(–1)-foliolate; terminal leaflet ovate or elliptic, obtuse at base, acute at apex..... *D. laxiflorum*
13. Loments with 10–12 articles, scarcely constricted between articles, stalked; articles 4.5–5.5 mm long, narrowly oblong; seeds ca. 3 mm long; petioles less than 1 mm long; leaflets narrowly ovate or narrowly elliptic; 11–23 cm long..... *D. teres*
13. Loments with 3–10 articles, constricted between articles, sessile; articles 10–20 mm long, narrowly elliptic; seeds 4.4–5

mm long; petioles 1–3 cm long; leaflets usually ovate-elliptic or narrowly ovate-elliptic, obtuse to round or sometimes slightly cordate at base, (3–)5–12(–18) cm long ..... *D. zonatum*

14. Stipules connate and nearly surrounding stem especially when young 15
14. Stipules free; pedicels deciduous with or after loments fall off 16
15. Flowers one per node, subtended by one primary and two secondary bracts; pedicels thick, persistent with a calyx-remnant at top after loments fall off ..... *D. incanum*
15. Flowers two per node, each subtended by one secondary bract; pedicels slender, early deciduous ..... *D. distortum*
16. Leaves 1-foliolate, rarely with a few 3-foliolate leaves 17
16. Leaves 3-foliolate, sometimes mixed with 1-foliolate leaves 18
17. Terminal leaflet broadly ovate, upper surface pubescent, lower surface velutinous; loments with straight hairs and often mixed with minute hooked hairs on lateral surfaces, isthmus ca. 3/4 as broad as the loment; pedicels 1.5–2 mm long ..... *D. velutinum*
17. Terminal leaflet elliptic to ovate, upper surface glabrous or almost so, lower surface appressed pubescent; loments with minute hooked hairs on lateral surfaces, isthmus 1/3–1/2 as broad as the loment; pedicels 3–4 mm long .... *D. gangeticum*
18. Terminal inflorescence racemose paniculate, much branched and densely flowered; rachis somewhat angulate; bracts early deciduous ..... *D. cajanifolium*
18. Terminal inflorescence racemose, not densely flowered as above; rachis terate; bracts early deciduous 19
19. Plants rather densely hairy; branchlets and at least lower surfaces of leaves with spreading hairs 20
19. Plants not densely pubescent; branchlets and lower surfaces of leaves glabrous or with sparse appressed hairs ..... *D. gunnii*
20. Terminal leaflet to 6 cm long; loment articles 3.5–4 × 2.5–3 mm; trailing or sprawling plants ..... *D. rhytidophyllum*
20. Terminal leaflet more than 6 cm long; loment articles more than 5 mm long, more or less erect plants ..... *D. tenax*
21. Upper calyx-lobes connate near to the apex, hence the calyx apparently 4-lobed; flowers 2 or more per node of inflorescence, densely flowered, pseudo-racemose 22
21. Upper calyx-lobes shortly connate from base to less than half the length; flower one or rarely 2 per node of inflorescence, lax flowered, racemose or rarely pseudo-racemose; pedicels usually long, filiform, often divaricate in fruits; leaves small, 3-foliolate; plants herbaceous...30
22. Calyx 6 mm or more long, lowest lobe ca. 5 mm long; standard ca. 1 cm long; loments shortly stipitate ..... *D intortum*
22. Calyx less than 6 mm long, lobes less than 5 mm long; standard to ca 8 mm long; loments sessile 23
23. Primary bracts usually narrowly triangular or narrowly ovate, not entirely covering the flower-buds; lower sutures of loment deeply constricted, hence isthmi usually less than half as broad as the loment ..... *D. bolsteri*
23. Primary bracts dense and entirely covering the flower-buds, hence the young parts of the inflorescence similar in appearance to coniferous strobiles; upper sutures of loments nearly straight or slightly undulate, lower sutures shallowly constricted, hence isthmi usually more than half as broad as the loment ... 24
24. Articles of the loment at least twice as long as broad 25
24. Articles of the loment less than twice as long as broad 26
25. Pedicels 0.7–2 mm long and curved in fruit; stipules persistent; terminal leaflet

ovate, elliptic or oblong elliptic, obtuse or acute at apex, 2–8 cm long, lower surface with densely appressed silky hairs ..... *D. nemorosum*

25. Pedicels 7–12 mm long and not curved in fruit; terminal leaflet obovate, rounded at the apex, 1.5–4(–5.5) cm long, lower surface usually sparsely pubescent ..... *D. adscendens*
26. Loments plicate-retroflexed when young; inflorescences 1–3(–5) cm long, densely flowered; leaves 1- and 3-foliolate; leaflets broadly obovate or broadly elliptic, often orbicular or transversely broadly elliptic, rounded or cordate at the base..... *D. styracifolium*
26. Loments never plicate-retroflexed: inflorescences more than 3 cm long; leaves 1- or 3-foliolate; leaflets otherwise, distinctly longer than broad 27
27. Leaves always 1-foliolate, elliptic to nearly orbicular, rounded or slightly emarginate at the apex ..... *D. rubrum*
27. Leaves 3-foliolate 28
28. Loments erect or ascending when mature ..... *D. heterocarpon*
28. Loments reflexed when mature 29
29. Terminal leaflet narrowly elliptic to elliptic or sometimes obovate, lower surface dense appressed gray or silver hairy ..... *D. strigillosum*
29. Terminal leaflet obovate, lower surface appressed white hairy..... *D. capitatum*
30. Seeds conspicuously arillate around the hilum.....(*Codariocalyx microphyllus*)
30. Seeds not arillate but slightly rim-arillate 31
31. Inflorescences leaf-opposed, fasciculate and/or rarely short racemose, i. e., sympodial branching; upper two calyx-lobes slightly connate at the base 32
31. Inflorescences terminal, long, slender, racemose, i. e., monopodial branching; upper two calyx-lobes connate below the middle 33
32. Terminal leaflet cuneiform; loments hooked-hairy, articles 2–2.5 mm long and 2–3 mm wide; pedicels 3–13 mm long, only straight-hairy..... *D. triflorum*
32. Terminal leaflet elliptic or obovate; loments covered with both hooked and straight hairs, articles 3–4 mm long and 3–3.7 mm wide; pedicels 10–25 mm long, glabrous or covered with a few hooked hairs ..... *D. heterophyllum*
33. Loments with a band of densely appressed long hairs on lateral surfaces; calyx covered with spreading long yellowish hairs, lobes 2.3–3 mm long; stems very slender, covered with spreading long yellowish hairs; an annual herb ..... *D. auricomum*
33. Loments without a band of hairs on lateral surfaces 34
34. Terminal leaflet cuneiform, depressed ovate or orbicular; ovary and loment glabrous or with sparse uncinate hairs; upper suture of loments notched between articles..... *D. trichostachyum*
34. Terminal leaflet oblong or linear, narrow ovate or narrow oblong; ovary and articles (at least when young) with clavate trichomes; upper suture of loments continuous, not distinctly notched between articles..... 35
35. Terminal leaflet oblong, 10–35(–45) mm long, usually more than 3.5 mm wide, 1–5(–7) times longer than wide; rachis of inflorescence usually with long spreading hairs; plant prostrate..... *D. filiforme*
35. Leaves 3-foliolate; terminal leaflet linear, narrow ovate or narrow oblong, 10–50(–65) mm long, usually less than 4 mm wide, 3.5–13 times longer than wide; rachis (at least in upper part) without long spreading hairs; plant erect ..... *D. pullenii*

Desmodium auricomum Grah. [in Wall., Numer. List n. 5704 (1831–32), nom. nud.] ex Benth. in Miq., Pl. Jungh.: 223 (1852) [Type: Burma (Myanmar). Tavoy, Tenasse-

rium. W.Gomez in Wallich 5704. (K lecto.)]; Meeuwen in Reinwardtia **6**: 246 (1962); Backer & Bakh. f., Fl. Java **1**: 607 (1963); H. Ohashi in Ginkgoana **1**: 234 (1973) & in J. Jpn. Bot. **69**: 26 (1994).

Distr.: Myanmar, Thailand, Indo-China, and **Malesia** (Jawa).

Specimens examined: **Jawa**: Indramajoe. Steenis 8169 (BO, L); Kangean. Backer 27980 (BO); Madura island: Madoera. Backer 20432 (BO), Backer 20712 (BO), Boernik. Bremekamp s.n. in 1907 (BO, L).

This species has been found only in Jawa in Malesia, but collected in many localities in Indo-China where it shows wider variation than in Jawa and produces an endemic variety, var. *pseudoauricomum* H. Ohashi in Cambodia and Vietnam (Ohashi 1994). The species is supporsed to be derived from Indo-China through Malay Peninsula to Jawa, although it is not recorded from Malay Peninsula (Ridley 1922).

Desmodium bolsteri Merr. & Rolfe in Philipp. J. Sci., C. **3**: 102 (1908) [Type: Philippines. Luzon. Cagayan Prov., Pena Blanca. F. H. Bolster 181 (K lecto., see Ohashi 1998b)]; Merr. in Philipp. J. Sci., C. **5**: 83 (1910) & Enum. Philipp. Flow. Pl. **2**: 284 (1923); Meeuwen in Reinwardtia **6**: 265 (1962); H. Ohashi in Ginkgoana **1**: 250 (1973) & in J. Jpn. Bot. **73**: 260 (1998).

Distr.: **Malesia**: Philippines, endemic to Luzon.

Specimens examined: **Philippines**. Luzon. Cagayan Prov., Pena Blanca. Shrub 4 ft. high, alt. ca. 500 ft., on boulders in stream, flower "blue". Oct. 7, 1905. F. H. Bolster 181 (K lecto.); Tngnegarao, on rock in midstream, 500 ft. above the sea. 4 ft. high, fls. blue. Bolster 181, Oct. 7, 1905 (MO, UC), Mar.–May 1929, M. Ramos Bur.Sci.76896 (K, NY, SING); Prov. of Nueva Ecija, Alvarez FB22127, Dec. 1910 (K); Lagum. Adduru 209 (A).

There are two kinds of specimens in Bolster 181. The lectotype in K was collected at "Pena Blanca", but the other, in MO and UC, was collected at Tngnegarao in "Pena Blanca". Tngnegarao is a local place in Pena Blanca, so both specimens may be from the same locality. They are, however, different from each other, because the Kew specimen is in fruit (see Fig. 1 in Ohashi 1998b) as the species was described, i. e., "flowers unknown" in original description, while those in MO and UC bears flowers and young fruits. I treated both as different specimens (Ohashi 1998b).

Desmodium brachypodum A. Gray, U. S. Expl. Exped.: 434 (1854) [Type: Hunter River, U.S. Explor. (GH holo.)]; Benth., Fl. Austr. **2**: 232 (1864); Meeuwen in Reinwardtia **6**: 247 (1962); H. Ohashi in Ginkgoana **1**: 227 (1973); Verdc., Man. New Guinea Leg.: 394 (1979); Pedley in Austrobaileya **5**: 233 (1999).

Distr.: Asia: **Malesia** (New Guinea), Australia, and Pacific (Solomon Is., New Caledonia).

Specimens examined: **New Guinea**. Papua New Guinea. Bootless Inlet. Carr 12864 (BM, K, L, NY); c. 7 miles west of Kanosia Plantation. In open savannah woodland, alt. c. 30 ft. Flowers very pale mauve. Leaves crushed to use sap for staining billums green. 24 July 1962. Darbyshire 717 (K); 25 miles from north of Rami River. Blackwood 403 (K); near Andarora village. Blackwood 179 (K).

Leaves are variable in this species; usually 3-foliolate often with 1-foliolate in the lowest leaf, but sometimes mixed with 5- or 6-foliolate leaves.

Desmodium capitatum (Burm. f.) DC., Prodr. **2**: 336 (1825); Benth. in Miq., Pl. Jungh.: 225 (1852); Miq., Fl. Ned. Ind. **1**(1): 241 (1855); Ridl., Fl. Malay Pen. **1**: 609 (1922); Merr. in Philipp. J. Sci., C. **5**: 84 (1910) & Enum. Philipp. Flow. Pl. **2**: 284 (1923); Craib, Fl. Siam. Enum. **1**: 404 (1928); Backer & Bakh. f., Fl. Java **1**: 606 (1963); Rugayah in Floribunda **1**(8): 31, fig. 1 (1988).

Hedysarum capitatum Burm. f., Fl. Ind.: 167, t. 54. fig. 1 (1768) [Type: from India. N. L. Burmann].

Pseudarthria capitata (Burm. f.) Hassk., Cat. Hort. Bot. Bogor. 281 (1844) & Pl. Jav. Rar. 390 (1848).

Meibomia capitata (Burm. f.) Kuntze, Rev. Gen. Pl. **1**: 195 (1891).

Distr.: India, **Malesia**, and Micronesia (Yap, fide Fosberg 1966).

Specimens examined: **Philippines**. Mindanao. Edano PNH1533 (L); Elmer 11985 (BM, L).

Desmodium capitatum and *D. styracifolium* or *D. retroflexum* had been treated as distinct from each other (Merrill 1923, Schindler 1928), but Meeuwen (1962) regarded them as a single species because of the existence of forms intermediate between them. Backer and Bakhuizen van den Brink Jr. (1963) maintained *D. capitatum* for Javanese plants. Rugayah (1988) suggested further differences, in the calyx and pods, adding to the previously known characteristics in leaves. I confirmed the result of Rugayah, so these species are treated as separated here. Rugayah recorded *D. capitatum* from Borneo, Jawa, Lesser Sunda Is, Maluku, Philippines, Sulawesi and Sumatera, while *D. styracifolium* is only from Sulawesi.

These two differs as follows:

1. Leaves 3-foliolate, terminal leaflet obovate, lateral and lowest calyx lobes triangular, and loments straight..... ..... *D. capitatum*
1. Leaves 1–3-foliolate, terminal leaflet broadly elliptic to orbicular or transversely broadly elliptic, lateral and lowest calyx lobes ovate with a slightly acuminate apex, and loments plicate-retroflexed when young but later becoming straight..... *D. styracifolium*

Desmodium dichotomum (Willd.) DC., Prodr. **2**: 336 (1825); Meeuwen in Reinwardtia **6**: 248 (1962); Backer & Bakh. f., Fl. Java **1**: 604 (1963); H. Ohashi in Ginkgoana **1**: 173, pl. 21a (1973), excl. syn.

Hedysarum dichotomum Willd., Sp. Pl. **3** (2): 1180 (1802).

Desmodium diffusum (Willd.) DC., Prodr. **2**: 336 no. 106 (Nov. 1825), nom. illegit., non no. 88 on page 335.

D. amplexicaule Zoll. & Moritzi in Nat. en Geneesk. Arch. Neêrl. Ind. **3**: 58, 77 (1846) [Type: Jawa. Besoeki. Zollinger 2789 (iso. A, BM, BO)].

D. strangulatum Wight & Arn. var. *parvulum* Miq., Fl. Ned. Ind. **1**(1): 255 (1855) [Type: Jawa. Provincie Panaroekan, bij Soember Waroe. bij Soerakarta. Sumatra. bij Palembang en elders. (n. v.)].

Distr.: India, Myanmar, China (Yunnan) and **Malesia** (Jawa, Lesser Sunda Is., and Sulawesi).

Specimens examined: **Jawa**. G.Semongkrong. Backer 24227 (BO); Backer 37063 (L). Besoeki. Zollinger 2789 (A, BM, BO), Backer 24614 (BO); Pasoercean. Backer 4017 (BO), Backer 7534 (BO, L); Backer 13060 (K, L). **Lesser Sunda Is.** Timor. C.Monod de Froideville 1025 (BO) & 1172 (BO). **Sulawesi**. Soppeng. C.Monod de Froideville 40 (BO, L), 361 (L) & 373 (L).

Desmodium diffusum DC. in Ann. Sci. Nat. **4**: 100 (Jan. 1825) [Type: India orient. Lambert (G-DC), n. v., fide microfiche Candolle: Prodromi Herbarium in TUS] & Prodr. **2**: 335 no. 88 (Nov. 1825), non *D. diffusum* (Willd.) DC., Prodr. **2**: 336 no.106 (Nov. 1825), quae est *D. dichotomum* (Willd.) DC.: H. Ohashi in H. Hara, Origin Evol. Divers. Pl. & Pl. Commun.: 178 & 186 (1985); H. Ohashi & al. in Sci. Rep. Tohoku Univ. ser. 4, Biol. **39**: 215 (1988); H. Ohashi in Dy Phon & al., Fl. Camb. Laos Vietn. **27**: 86 (1994), excl. syn. cit. *H. recurvatum* Roxb. et *D. recurvatum* (Roxb.) Wight & Arn.; H. Ohashi in J. Jpn. Bot. **70**: 113 (1995); Huang & H. Ohashi in Fl. Taiwan ed. 2, **3**: 252, t. 123 ut *D. laxiflorum* (1993).

Hedysarum diffusum Roxb., [Hort. Beng. no. 57 (1814), nom. nud.] Fl Ind. **3**: 357 (1832), non Willd. (1802) [Type: India orient. Roxburgh, Cat. no. 57 (BM), n. v.].

Desmodium laxiflorum subsp. *parvifolium*

H. Ohashi & T. T. Chen in J. Jpn. Bot. **58**: 268, figs. 1–2 (1983); H. Ohashi & al. in Sci. Rep. Tohoku Univ. ser. 4, Biol. **38**: 305 (1984) [Type: Taiwan. Pingtung Co.: Mutan. H. Ohashi & al. 13486 (TUS holo.)].

D. unibotryosum C. Chen & X. J. Cui in Acta Bot. Yunnan. **9**: 307 (1987), nom. illeg. [based on *Hedysarum diffusum* Roxb. (1814), nom. nud.].

D. laxiflorum auct. non DC.: Benth. in Miq., Pl. Jungh.: 228 (1852), p. p.; Meeuwen in Reinwardtia **6**: 252 (1962), p. p.; H. Ohashi in Ginkgoana **1**: 101 (1973), p. p.; Verdc., Man. New Guin. Leg. 401 (1979), p. p.; Huang & H. Ohashi in Fl. Taiwan ed. 2, **3**: pl. 123 (1993), excl. desr.

Distr.: India, Myanmar, Thailand, Indo-China, **Malesia** (throughout), China, Taiwan.

Specimens examined: **Borneo**. Kaung. Darnton 492 (BM). **Jawa**. Junghuhn 160 (K, L). **Philippines**. Luzon. Honlong. Mendoza 6 Buwaya PNH 76744 (L). **New Guinea**. Sepik District, along Bliri River near Kaiye village, on sandy riverbank, alt. c. 250 ft. Darbyshire & Hoogland 8148 (BM); Jappen-Biak. Aet & Idjan 964 (L); Gjellerup 210 (L). **Sulawesi**. T.Kauderns 319 (S); Zeef 35 (L). **Sumatera**. Matthew s. n. (K), H.Surbeck 117 (A), Korinchi. Robinson & Kloss s. n. 24 May 1914 (BM); Wilde & Wilde-Duyfjes 12305 (L); Achmad 518 (L); Iwatsuki & al. 631 (L); Lesger 63 (L); Pasthumus 921 (L) Schiffner 2067 (L); Rarta 24 (L).

Desmodium diffusum DC. and *D. diffusum* (Willd.) DC. are entirely different species. The former was published in January 1825 (Candolle 1825a), while the latter in November 1825 (Candolle 1825b). Hence, the former is earlier homonym to the latter and is the correct name for this species. The later is a later homonym and is a synonym of *D. dichotomum* (Willd.) DC.

Desmodium diffusum DC. had not been recognized as distinct and is usually mixed with *D. laxiflorum*, although both differ clearly from each other. They seem to be separated in habitat, but their habitat preferences are not clear. *Desmodium diffusum* is commoner than *D. laxiflorum* in China and Taiwan but is the less prevalent species in Nepal and probably Malesia.

Desmodium filiforme Zoll. & Moritzi in Natuur-en Geneesk. Arch. Nedeêl. Ind. **3**: 58, 77 (1846) [Type: Jawa. Sandy coast near Poeger. Zollinger 2738, in 1845. Herb. Shuttleworth (BM holo.; iso. BO)]; Miq., Fl. Ned. Ind. **1**(1): 239 (1855); Meeuwen in Reinwardtia **6**: 249 (1962), p. p.; Backer & Bakh. f., Fl. Java **1**: 608 (1963); H.Ohashi in Ginkgoana **1**: 237 (1973); Verdc., Man. New Guinea Leg.: 396 (1979); Pedley in Austrobaileya **5**: 238 (1999). (Fig. 3).

Desmodium neurocarpum Benth., Fl. Austr. **2**: 234 (1864) [Type: Australia. Upper Victoria river. Mueller (K holo.)].

D. neurocarpum var. *queenslandicum* Domin, Biblioth. Bot. **89**: 214 (1926) [Type: Australia. In fl. Flinders River ad opp. Hughenden. Feb. 1910. Domin 4733 (PR 527380 designated by Pedley 1999)].

Distr.: **Malesia** (Jawa and New Guinea) and Australia.

Specimens examined: Malesia: **Jawa**. Besoeki. Sandy coast near Poeger. Zollinger no. 2738, in 1845 (BM holo, BO iso; photo TUS); Altmann 410 (BO, GH, L); Altmann 454 (BO); Backer 35410 (BO, TUS), Backer 36520 (L); Ultee s. n. in 1917 (BO); Poeger. Ultee s. n. (BO); Booberg & Backer s.n. in 1929 (BO); Buwalda 7197 (BO). **New Guinea**. Meraube, in hortis. 15 Aug. 1904. Koch 679 (L); Koitaki. Open savannah land, c. 1500 ft. fls. pink. 24 June 1935. Carr 12673 (BM, K, L, NY).

Desmodium gangeticum (L.) DC., Prodr. **2**: 327 (1825); Benth. in Miq., Pl. Jungh.: 228 (1852); Miq., Fl. Ned. Ind. **1**(1): 247 (1855); Ridl., Fl. Malay Penins. **1**: 610 (1922); Merr., Enum. Philipp. Flow. Pl. **2**: 285 (1923); Meeuwen in Reinwardtia **6**: 249 (1962); Backer & Bakh. f., Fl. Java **1**: 607 (1963); H. Ohashi in Ginkgoana **1**: 184 (1973); Verdc., Man. New Guinea Leg.: 397 (1979); Smith, Fl. Vitiensis Nova **3**: 190 (1985); Pedley in Rev. Handb. Fl. Ceylon **10**: 182 (1996) & in Austrobaileya **5**: 249 (1999).

Fig. 3. Holotype of *Desmodium filiforme* Zoll. & Moritzi (BM).

Hedysarum gangeticum L., Sp. Pl.: 746 (1753) [Type: *Hedysarum* no. 13. Inde (LINN 921/13)].

H. styracifolium auct. non Osbeck: Poiret in Lam., Encycl. **6**: 399 (1805), ut "*H. styracifolium* L."

Distr.: Asia, Australia, and Africa, naturalized in the West Indies. Asia: W. Asis (Yemen, Oman, Soudi Arabia), Sri Lanka, India, Myanmar, Thailand, Indo-China, **Malesia** (throughout), Solomon Is., China, Taiwan, and Japan (S. Ryukyus).

Hedysarum styracifolium L. in the sense of Poiret was regarded by Schindler (1928) as *Desmodium velutinum* (Willd.) DC., but the voucher specimen in the Lamarck Herbarium (P) is identified as *D. gangeticum* (L.) DC.

Desmodium gunnii Benth. ex J. D. Hook., Fl. Tasmanicae **1**: 101 (1856) [Type: Tasmania. R.C. Gunn 243 (K lecto., see Pedley 1999; isolecto. BM, GH)]; Verdc., Man. New Guinea Leg.: 397 (1979); Pedley in Austrobaileya **5**: 251 (1999).

Distr. **Malesia** (New Guninea), Australia, Tasmania, and New Caledonia.

Specimen examined: **New Guinea**. Papua. Sesenaro, 4000 ft. Flowers pink. Cruttwell 1199 (K).

The specimen cited is the only collection of the species in New Guinea (Pedley 1999).

Desmodium heterocarpon (L.) DC., Prodr. **2**: 337 (1825), ut *D. heterocarpum*; Merr. in Philipp. J. Sci. C. **5**: 84 (1910) & Enum. Philipp. Flow. Pl. **2**: 285 (1923); Meeuwen in Reinwardtia **6**: 93 (1961) & 251 (1962); Backer & Bakh. f., Fl. Java **1**: 607 (1963); H. Ohashi in Ginkgoana **1**: 210 (1973); Verdc., Man. New Guinea Leg.: 399 (1979); Smith, Fl. Vitiensis Nova **3**: 192 (1985); H. Ohashi in Sci. Rep. Tohoku Univ. ser. 4, Biol. **39**: 175 (1988) & in J. Jpn. Bot. **66**: 17 (1991); Pedley in Austrobaileya **5**: 244 (1999).

Hedysarum heterocarpon L., Sp. Pl. 747 (1753) [Type: Ceylon. Herb. Hermann 2: 32, No. 294, left-hand specimen (BM lecto. by Pedley in Turland and Jarvis 1997)].

Distr.: Africa, Asia, Australia, and Pacific. Asia: Sri Lanka, India, Myanmar, Thailand, Indo-China, **Malesia** (throughout), China, Taiwan, and S. Japan.

This is an extremely polymorphic species and contains eight infraspecific taxa, for which a key is provided by Ohashi (1991).

Key to the infraspecific taxa of *Desmodium heterocarpon*

1. Terminal leaflets narrowly ovate, 3–6.5 times longer than broad. Inflorescences 10–30 cm long, not branched ....subsp. *angustifolium*
1. Terminal leaflets otherwise, less than 3 times longer than broad. Inflorescences 3–13 cm long, simple or branched.....2
2. Inflorescences short, usually less than 5 cm long, very densely flowered. Pods with densely long yellowish or whitish hooked hairs. Terminal leaflets ovate or elliptic to broadly ovate, acute or obtuse, glabrous or nearly glabrous above. Flowers more than 4 mm long with pedicels 2–3 mm long. Prostrate, stoloniferous herbs or subshrubs ....subsp. *ovalifolium*
2. Inflorescences elongated. Pods sparsely to densely pubescent with white, hooked or straight hairs. Terminal leaflets usually obovate, elliptic or oblong, sparsely to subdensely hairy above. Flowers 3–4 mm long with pedicel 4–7 mm long. Erect or ascending or prostrate herbs or subshrubs.....3 (subsp. *heterocarpon*)
3. Inflorescence-rachis densely covered with appressed or ascending, straight hairs, rarely mixed with a few spreading hooked hairs. Pedicels usually glabrous but occasionally puberulent ....var. *strigosum*
3. Inflorescence-rachis covered with spreading, hooked hairs. Pedicels with

spreading, minute glandular hairs .....
.....var. *heterocarpon*

subsp. **heterocarpon**: H. Ohashi in Ginkgoana **1**: 212 (1973).

var. **heterocarpon**: Meeuwen in Reinwardtia **6**: 93 (1961) & 251 (1962).

Desmodium buergeri Miq. in Ann. Mus. Bot. Lugd.-Bat. **3**: 45 (1867); Merr. in Philipp. J. Sci., C. **5**: 86 (1910) & Enum. Philipp. Flow. Pl. **2**: 284 (1923).

D. toppinii Schindl. in Repert. Spec. Nov. Regni Veg. **21**: 5 (1925) [Type: Myanmar. Wasi, 200 m. Toppin 4048 (CAL holo., iso. E)]; H. Ohashi in Ginkgoana **1**: 226 (1973).

Distr. (var. *heterocarpon*): Sri Lanka, India, Myanmar, Thailand, Indo-China, **Malesia** (throughout), China, Taiwan, S. Japan. Australia and Pacific.

Specimens examined: **Borneo**. Behind Tamu Darat. Daruton 71 (BM), Jesseloton. Topping 1945 (US). **Lesser Sunda Is**. Timor. Forbes 4102 (BM). **New Guinea**. Papua. Carr 14677 (BM), Hoogland & Pullen 6233 (BM).

A white flowered form of this species is recorded from Malay Peninsula, f. *albiflorum* (Ridl.) H. Ohashi in J. Jpn. Bot. **66**: 20 (1991) [= *Desmodium polycarpum* var. *albiflorum* Ridl., Fl. Malay Penins. **1**: 609 (1922)].

var. **strigosum** van Meeuwen in Reinwardtia **6**: 95 (1961) [Type: New Guinea. Hollandia Hamadi. C. Kalkman BW3596. 22 Aug. 1956 (L holo.)] & in Reinwardtia **6**: 251 (1962); H. Ohashi in Ginkgoana **1**: 215 (1973); Verdc., Man. New Guinea Leg.: 399 (1979); Fosberg & Sachet in Micronesica **18**: 195 (1982); Smith, Fl. Vitiensis Nova **3**: 193 (1985).

Hedysarum polycarpon Poir. in Lam., Encycl. **6**: 413 (1805) [Type: Indes orientales in herb. Lam (P)].

Desmodium polycarpon (Poir.) DC., Prodr. **2**: 334 (1825), as "*polycarpum*": Miq., Fl. Ned. Ind. **1**(1): 242 (1855); Ridl., Fl. Malay Penins. **1**: 609 (1922).

Hedysarum purpureum Roxb., [Hort. Beng.: 57 (1814), nom. nud.] Fl. Ind. ed. 2, **3**: 358 (1832).

Desmodium siliquosum (Burm. f.) DC., Prodr. **2**: 336 (1825).

D. purpureum (Roxb.) Hook. & Arn., Bot. Beechey. Voy.: 62 (1833). cf. Fosberg & Sachet in Micronesica **18**: 195 (1984).

D. heterocarpon var. *strigosum* f. *substrigosum* Fosberg in Micronesica **2**: 146 (1966) [Type: Caroline Is. Moen Island, 600 ft. Hosaka 2704 (US holo.)].

Distr. (var. *strigosum*): **Malesia** (throughout) to Australia and Pacific; naturalized in Hawaii. This is the commonest form of *Desmodium heterocarpon* occurring in Malesia.

Specimens examined: **Borneo**. Sampit. Alston 13103 (BM). **Jawa**. Junghuhn. s.n. (BM). **New Guinea**. Papua. Brass 3734 (BM), 5705 (BM), 7535 (BM) & 8345 (BM). **Philippines**. Busuanga. Lopez 41383 (BM); Leyte. Wenzel 1453 (BM); Luzon. Elmer 17162 (BM). **Sumatera**. Sopsopan. Rahmat Si Toroes 5532 (US); Hitean Haloban. Rahmat Si Toroes 4230 (US).

subsp. **angustifolium** H. Ohashi in Ginkgoana **1**: 212 (1973) & in J. Jpn. Bot. **66**: 17 (1991) [Type: the type of *Desmodium reticulatum* Champ. ex Benth.].

Desmodium reticulatum Champ. ex Benth. in Hook., Kew J. **4**: 46 (1852) [Type: Hong Kong. Champion 254 (K holo.)]; Yang & Huang in Fl. Reipubl. Pop. Sin. **41**: 31 (1995).

D. polycarpum var. *rigidum* Ridl. in J. Str. Br. Roy. As. Soc. **59**: 97 (1911) [Type: Peninsular Malaysia. Kedah, Alor Sta. Ridley 15147 (K holo.)], & Fl. Malay Penins. **1**: 609 (1922).

Distr. (subsp. *angustifolium*): Myanmar, Thailand, Indo-China, **Malesia** (Malaya), and S & SW. China.

Specimens examined: **Malaya**. Peninsular Malaysia. Langkawi, near Sanatorium. Corner & Nauen 38112 (K); Wallich H. I. 5729L (K); Penang. Wallich s. n. (BM), Porter (K), Ridley 15147 (BM).

Desmodium polycarpum var. *rigidum* Ridley is identical with *Desmodium heterocarpon* subsp. *angustifolium* (Craib.) H. Ohashi (Ohashi 1991). The subspecies is evidently rare in Malay Peninsula, and is supposed to be derived from Indo-China to Malay Peninsula.

subsp. **ovalifolium** (Prain) H. Ohashi in J. Jpn. Bot. **66**: 21 (1991).

Desmodium polycarpum DC. var. *ovalifolium* Prain in J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. **66**: 141 (1897) [Type: Penang; Perak Wallich; Goping. Kunstler 1007].

D. ovalifolium Wall. [Numer. List n. 5730 (1831-32), nom. nud.] ex Merr. in Philipp. J. Sci., C. **5**: 85 (1910); Gagnep. in Fl. Indo-Chine **2**: 587 (1920); Ridl., Fl. Malay Pen. **1**: 610 (1922); Merr., Enum. Philipp. Flow. Pl. **2**: 287 (1923); Craib, Fl. Siam. Enum. **1**: 414 (1928).

D. heterocarpon var. *ovalifolium* (Wall.) Rugayah in Reinwardtia **10**: 382 (1987).

Distr. (subsp. *ovalifolium*): Thailand, Indo-China, and **Malesia**.

Specimens examined: **Borneo**. Grabowsky s. n. (BM); Gibbs 2923 (BM), Haviland & Hose 3283B (BM); Sabah. Poring. Meijer 131922 (A); Sarawak. Baram. Hose 515 (BM). **Jawa**. Forbes 73 (BM). **Malaya**. Penang. Wallich 5730A (BM), Ridley 11385 (BM); Negri Sembilan. Holttum 9714 (BM); Kedah. Ridley 15144 (BM). **Philippines** (fide Merrill 1923). **Sumatera**. Si Mandi Angin. R. S. Toroes 4167 (NY).

The hairs on the inflorescences of subsp. *ovalifolium* show a similar pattern to those of subsp. *heterocarpon* var. *heterocarpon*.

Desmodium heterophyllum (Willd.) DC., Prodr. **2**: 334 (1825); Miq., Fl. Ned. Ind. **1**(1): 238 (1855); Ridl., Fl. Malay Penins. **1**: 606 (1922); Merr., Enum. Philipp. Flow. Pl. **2**: 286 (1923); Meeuwen in Reinwardtia **6**: 251 (1962); Backer & Bakh. f., Fl. Java **1**: 608 (1963); H. Ohashi in Ginkgoana **1**: 239 (1973); Verdc., Man. New Guinea Leg.: 400 (1979); Smith, Fl. Vitiensis Nova **3**: 194 (1985); Pedley in Austrobaileya **5**: 236 (1999).

Hedysarum heterophyllum Willd., Sp. Pl. **3**(2): 1201 (1802) [Type: Herb. Willdenow 13832 (B-W n. v.; microfiche)].

Distr.: Sri Lanka, India, Thailand, Indo-China, **Malesia**, S. China, and Taiwan. Introduced into N. Australia and Micronesia (Pedley 1996).

Specimens examined: **Borneo**. Danton 40 (BM); Kalimantan. Kessler 549 (L); Sandakan and vicinity. Ramos 1777 (US); Sarawak. Brooke 9625 (BM), Purseglove & Shah P.4360 (A). **Jawa**. Horsfield s. n. (BM, GH), Bogor. Harini 43 (A). **Malaysia**. Selangor. Worthington 12758 (A). Singapore. Purseglove P. 4050 (A). Togashi 6112232 (A, TI). **New Guinea**. Papua. Dagwa. Brass 6074 (BM), Simaga 831 (A), Hrnty 16802 (A). **Philippines**. Palawan. Merrill 1309 (A, p. p. excl. *D. triflorum*; BM); Taytay. Merrill 9297 (A, BM, NY). **Sumatera**. Boeea 8432 (A), Forbes 2632 (BM), Toroes 1078 (A), Rangga Pajoeng. Rahmat Si Toroes 3314 (US), Aer Kandis. Rahmat Si Toroes 2802 (US).

Desmodium laxiflorum DC. in Ann. Sci. Nat. **4**: 100 (1825) [Type: Napaulia. Wallich (G holo.)] & Prodr. **2**: 335 (1825); Benth. in Miq., Pl. Jungh.: 228 (1852), p. p., excl. *D. diffusum* DC.; Merr., Enum. Philipp. Flow. Pl. **2**: 286 (1923); Meeuwen in Reinwardtia **6**: 252 (1962), p. p., excl. *D. diffusum* DC., *Hedysarum diffusum* Roxb., *H. roxburgii* Spreng.; Backer & Bakh. f., Fl. Java **1**: 606 (1963); H. Ohashi in Ginkgoana **1**: 101 (1973), p. p., excl. *D. diffusum* DC., *Hedysarum diffusum* Roxb., *H. roxburgii* Spreng., *D. laxiflorum* var. *formosense* Ohwi; Verdc., Man. New Guinea Leg.: 401 (1979); H. Ohashi in Dy Phon & al., Fl. Camb. Laos Vietn. **27**: 87 (1994).

Distr.: India, Myanmar, Thailand, Indo-China, **Malesia**, China, and Taiwan (rare).

Specimens examined: **Jawa**. Steenis 1938 (L, NY). **Lesser Sunda Is**. W. Flores. Kostermans & Wirawan 81 (BO, US), 110 (A, K, L, US); Flores. Afriastini 1524 (BO). Lombok. Ampenan. Sun Hong-Fan Herbarium 9137, BO), Soemba. Iboet 182 (BO), Elbert 640 (A, L); Sumbawa. Kuswata 89 (A, BO); Timor. Bloembergen 3383 (BO). **Maluku**. Ambon. Boerlarge 297 (BO), Buru-Seram, Kai Isl., Obi-Bacan. **New**

Guinea. Henty 10512 (A). **Philippines**. Luzon. Bartlett 15751 (NY), Merrill Sp. Blanc. 175 (NY), Williams 269 (NY); Palawan. Bermejos Bur. Sci. 239 (NY). Mindanao. Zwickey 673 (NY). **Sulawesi**. Hennipman 5849 (A, L).

Desmodium megaphyllum Zoll. in Nat. & Geneesk. Arch. Neerl. Ind. **3**: 58, 77 (1846) [Type: Java. Junghuhn 144 (K)]; Miq., Fl. Ned. Ind. **1**(1): 245 (1855); Ridl., Fl. Malay Penins. **1**: 608 (1922); Meeuwen in Reinwardtia **6**: 100 (1961) & 253 (1962); Backer & Bakh. f., Fl. Java **1**: 606 (1963); H. Ohashi in H. Hara, Fl. E. Himal. **2**: 299, fig. 43a (1971).

Desmodium karensium Kurz in J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. **45**: 228, 232 (1877) [Type: Burma (Myanmar). Martaban. Kurz (K syn.); Ava, Khakyen Hills east of Bhamo. Kurz. (K syn.)]; Prain in J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. **66**: 397 (1897); Schindl. in Repert. Spec. Nov. Regni Veg. **21**: 1 (1925).

D. prainii Schindl. in Repert. Spec. Nov. Regni Veg. **21**: 2 (1925) [Type of *D. megaphyllum* Zoll.], nom. illegit.

Distr.: India (Assam), Myanmar, Thailand, **Malesia** (Jawa, Malaya, Maluku, Sumatera) and China (Yunnan).

Specimens examined: **Jawa**. Backer 14096 (K), Backer 22389 (K, L), Backer 37367 (L); Backhuizen 2604 (K), Burck 359 (K), Clason K.51 (A); Coert 1135 (A, L), DeVriese s. n. (K), Holstvoogd 184 (L); Junghuhn 123 (K), 124 (K) & 125 (K), Junghuhn 144 (K), Koorders 2960B (K), Koorders 28581B (K), Steenis 11082 (A, K, L, NY), Wisse 1031 (L); Zollinger 2522 (A, BM). **Malaya**. Perak. Ridley 13574 (BM). **Maluku**. Amboin. Teijsmann s. n. (L). **Sumatera**. Korthals s. n. (L).

Schindler (1925) divided *Desmodium megaphyllum* into *D. karensium* and *D. prainii*, but the latter includes the type of *D. megaphyllum*.

A record of this species from Australia by Meeuwen (1963) is erroneous for *Phyllodium hackeri* Pedley.

Desmodium nemorosum F. Muell. ex Benth., Fl. Austr. **2**: 234 (1864) [Type: Australia. Brisbane River. Mueller (K syn.); Pine River. Fitzalan (K syn.); sine loc. Leichhardt (K syn.), fide Pedley 1999]; Meeuwen in Reinwardtia **6**: 254 (1962); H. Ohashi in Ginkgoana **1**: 218 (1973); Verdc., Man. New Guinea Leg.: 403 (1979); Pedley in Austrobaileya **5**: 247 (1999).

Desmodium archiboldianum Baker f. in Brittonia **2**: 318 (1937). [Type: Wuroi, Oriomo River, Western Division. Few plants on a savannah ridge; alt. 10–30 m. Fls. reddish pink. Brass 5732 (BM holo.; iso. A, NY, US)].

D. nemorosum var. *novoguineense* Kaneh. & Hatus. in Bot. Mag. Tokyo **56**: 366 (1942). [Type: Papua New Guinea. Waren. Kanehira & Hatusima 12930 (A iso.; K holo. photo)].

Pedley (1999) pointed out that the specimens from Australia cited by Ohashi (1973) in Ginkgoana under *Desmodium nemorosum* var. *whitfordii* (Schindl.) H.Ohashi are referable to typical *D. nemorosum*. At that time *D. nemorosum* was a polymorphic, variable species confined to Australia and New Guinea. Var. *whitfordii* (endemic to the Philippines) was regarded as a distinct species, *D. whitfordii* (Schindl.) Pedley. However, *D. whitfordii* is quite similar to *D. nemorosum* and differs only slightly, in the leaflets. This is in spite of the long distance of separation between them. Hence, I recognize these as distinct at the subspecific rank. They differ as follows:

Key to the subspecies of *Desmodium nemorosum*

1. Terminal leaflet ovate, acute at apex ....subsp. *whitfordii*
1. Terminal leaflet elliptic, oblong-elliptic, obtuse at apex .....subsp. *nemorosum*

subsp. **nemorosum**

Distr.: **Malesia** (New Guinea) and Australia (Queensland to New South Wales).

Specimens examined: **New Guinea**. Papua. Dieni. Brass 3788 (A, BM, NY); Wuroi. Brass 5732 (A, BM, NY & US); Lake Daviumbu. Brass 7911 (A, BM, BO, K, L); Gaima. Brass 8344 (A, BM, BO, K, L); Tarara. Brass 8653 (A, BM, BO, L); Waren. Kanehira & Hatusima 12930 (A iso. of *D. nemorosum* var. *novoguineense* Kaneh. & Hatus.).

subsp. **whitfordii** (Schindl.) H. Ohashi, comb. nov.

Desmodium nemorosum var. *simplex* Schindl. subvar. *whitfordii* Schindl. in Repert. Spec. Nov. Regni Veg. **21**: 10 (1925) [Type: Phillippines. Luzon. Prov. Bataan, Mt. Mariveles, Lamo River. H.N. Whitford 227 (K lecto., designated here; iso. CAL, NY, US)].

Desmodium nemorosum var. *whitfordii* (Schindl.) H. Ohashi in Ginkgoana **1**: 220 (1973).

Desmodium whitfordii (Schindl.) Pedley in Austrobaileya **5**: 247 (1999).

Distr.: **Malesia**, endemic to the Philippines.

Specimens examined: **Philippines**. Luzon. Lamao River, Mt. Mariveles. Whitford 227 (K, CAL, NY, US); Mt. Mariveles. Merrill 7611 (syn. BM, K, US), Meyer FB3115 (NY, US).

Desmodium pullenii Pedley in Austrobaileya **5**: 243 (1999) [Type: Australia. Northern Territory. 12 km S of Hayes Creek, 13°35′S. 131°30′E. April 1988. R. Pullen & Spottswood 11169 (CANB holo.)].

Distr.: Malesia (Lesser Sunda Is., new to New Guinea) and Australia.

Specimens examined: **Lesser Sunda Is**. Alor. Landschaft Koei, Moroe-Gendok, 200 m alt. 7 May 1938. O. Jaag 690 (L). **New Guinea**.; Fly River. Mabaduan. Weak, much-branched plant in savannah forest grass cover; fls. purple. Brass 6522 (K, L).

Desmodium renifolium (L.) Schindl. in Repert. Spec. Nov. Regni Veg. **22**: 262 (1926); Meeuwen in Reinwardtia **6**: 257 (1962); H. Ohashi in Ginkgoana **1**: 230 (1973), excl. var. *oblatum*; H. Ohashi in Dy Phon & al., Fl. Camb. Laos Vietn. **27**: 102 (1994).

Hedysarum renifolium L., Syst. Nat. ed. 10, 1169 (1759) [Type: Herb. Linn. No. 921.8 (LINN lecto. by Pedley in Turland and Jarvis 1997)].

H. reniforme L., Sp. Pl. ed. 2, 1051 (1763), nom. illegit.

Desmodium reniforme (L.) DC., Prodr. **2**: 327 (1825); Miq., Fl. Ned. Ind. **1**(1): 249 (1855); Backer & Bakh. f., Fl. Java **1**: 608 (1963).

Distr.: India, Myanmar, Thailand, Indo-China, **Malesia** (W. Jawa), China (Yunnan) and Taiwan.

Specimens examined: **Jawa**. Backer s. n. (L); De Neve 3807 (L); Lobb 54 (BM, K, L); Wisse 1047 (L).

This species is known only from Jawa within Malesia. It was recorded in Australia (Meeuwen 1963, Ohashi 1973), but is not included in the most recent work on Australian *Desmodium* (Pedley 1999). I could not confirm the species in Australia.

Desmodium rhytidophyllum F. Muell. ex Benth., Fl. Austr. **2**: 233 (1864) [Syntypes fide Pedley (1999): Australia. Port Jackson. Brown (K); Parramatta. Woolls (K, MEL); between Burnett and Dawson. Mueller (K); Queensland (cited by Bentham as 'near Rockhampton'). Dallachy (K)]; Verdc., Man. New Guinea Leg.: 406 (1979); Pedley in Austrobaileya **5**: 249 (1999).

Meibomia rhytidophylla (F. Muell. ex Benth.) Kuntze, Rev. Gen. Pl. **1**: 198 (1891).

Distr.: **Malesia** (New Guinea), New Caledonia and Australia.

Specimens examined: **New Guinea**. Papua. Croft & Lelean NGF34642 (K, L). Erect herb, height 0.5 m. Leaves dull dark green above, midgreen below with rust coloured hairs. Flowers purple.

This species is similar to *Desmodium incanum* (G. Mey.) DC., although the fruits are descending (ascending in *D. incanum*), and to *D. scorpiurus* (Sw.) Desv., but the stipules are not auriculate.

Desmodium rubrum (Lour.) DC., Prodr.

2: 327 (1825); Merr. in Trans. Amer. Philos. Soc. ser. 2, **24**: 202 (1935); H. Ohashi in Ginkgoana **1**: 220 (1973), in J. Arn. Arb. **71**: 383 (1990) & in J. Jpn. Bot. **70**: 115 (1995).

Ornithopus ruber Loureiro, Fl. Cochinch.: 452 (1790) [Type: Cochinchina. Loureiro s.n. (n.v.)].

Distr.: Indo-China, **Malesia** (Malaya), and China (Guangdong and Hainan).

Specimens examined: **Malaya**. Peninsular Malaysia. Pahang, sandy shore Praman. Ridley s. n., Aug. 1889 (K); Liban Chondong, Rompin River, Pahang. Evans s. n., July 1917 (K); Pahang, Kuala Pahang, sealevel. 24 Aug. 1935, Corner 29897 (K).

This species is new to Malesia. It is referable to the typical variety, var. *rubrum*: H. Ohashi in Ginkgoana **1**: 223 (1973) and in Dy Phon & al., Fl. Camb. Laos Vietn. **27**: 126 (1994). Other varieties, var. *macrocarpum* H. Ohashi and var. *uncinatum* H. Ohashi, are endemic to Vietnam.

Desmodium sequax Wall., Pl. Asia. Rar. **2**: 46, t. 157 (1831) [Type: India. cult. in Hort. Bot. Calcutta. Wallich 5712 (K-W holo., iso. CAL)]; Meeuwen in Reinwardtia **6**: 259 (1962); Backer & Bakh. f., Fl. Java **1**: 606 (1963); H. Ohashi in H. Hara, Fl. E. Himal. **2**: 315 (1971); Verdc., Man. New Guinea Leg.: 407, fig. 92 (1979).

D. strangulatum Wight & Arn. var. *sinuatum* Miq., Fl. Ned. Ind. **1**(1): 255 (1855) [Type: Sumatra. (L holo.)].

D. dasylobum Miq., Fl. Ned. Ind. Eerste Bijv.: 305 (1861) [Type: Sumatra occid. prope Batang Barus. Teijsmann (n.v.)]; Merr., Enum. Philipp. Flow. Pl. **2**: 284 (1923).

D. sinuatum Blume ex Baker in Hook. f., Fl. Brit. Ind. **2**: 166 (1876) [Type: Jawa. Horsfield L.73 (K holo.)].

D. sequax var. *sinuatum* (Miq.) Hosok. in J. Soc. Trop. Agric. **4**: 313 (1932).

Dollinera sequax (Wall.) Schindl. ex Hochr. in Candollea **6**: 483 (1936).

Desmodium sp. A: Verdc., Man. New Guinea Leg.: 412 (1979).

Distr.: India, Myanmar, Thailand, Indo-China, **Malesia**, China, and Taiwan.

Specimens examined: **Jawa** (introduced, fide Meeuwen 1962). Backer 13611 (K). **Maluku**. Koorders 17604 (K), 17614 (K). **Philippines**. Baguio. Merrill 11648 (BM); Luzon. Ramos & Edano Bur.Sci.37528 (BM). **New Guinea**. Gulf Dist., Kikori Subdist., On Purari river, upstream from Pide river, alt. 100 m. Lat. 7.00S, Long. 145.10E. B.Conn, G.Pattison, M.Sands & J.Wood. 20/8/75 (LAE66341); Star Mts. Kalkman 4330 (BM, L); Mafulu. Brass 5512 (BM), Balim River, 1600 m alt. Brass 11799 (A, BM); Madang. Sayers 21466 (BM); Utakwa River to Mt. Carstensz. Kloss s. n. (BM). **Sulawesi**. Johansson & al. 360 (K, L); Hennipman 5554 (K, L). **Sumatera**. de Wilde & de Wilde Duyfjes 16448 (K, L); Deleng Singkoet. Bartlett 6589 (US).

"*Desmodium* sp. A" from New Guinea (Verdcourt 1979) is referable to *Desmodium sequax*. I have examined the voucher specimen Conn & al. in LAE 66341 borrowed from LAE.

The distribution pattern of *Desmodium sequax* shows a rather large gap between continental Asia and Malesia and is similar to that of *Ohwia caudata*.

Desmodium strigillosum Schindl. in Bot. Jahrb. Syst. **54**: 57 (1916) [Type: Vietnam. Saigon, November 1864. Lefèvre s. n. (Nov. 1864) (P holo.)]; H. Ohashi in Ginkgoana **1**: 223 (1973) & in Dy Phon & al., Fl. Camb. Laos Vietn. **27**: 129, pl. 27 (1994); Pedley in Austrobaileya **5**: 246 (1999).

Key to the subspecies of *Desmodium strigillosum*

1. Leaves 3-foliolate, terminal leaflet narrowly to ordinary elliptic or obovate..... .....subsp. *strigillosum*
1. Leaves 1-foliolate, leaflets orbicular ....subsp. *celebicum*

subsp. **strigillosum**

Distr.: Myanmar, Indo-China, new to **Malesia** (Sumatera), and S. China

(Guangxi). Recently introduced in Australia (Pedley 1999).

Specimens examined: **Sumatera**. Langga Pajoeng. E. Coast. Laboehan Batoe: Si Mandi. Rahmat Si Toroes 3530 (US), Rahmat Si Toroes 3680 (US); Angin. Rahmat Si Toroes 4149 (US); Tapianoeli: Division Padang Si Dimpoean, Sopsopan on Aek Si Olip. Rahmat Si Toroes 5066 (US).

subsp. **celebicum** (Schindl.) H. Ohashi, comb. nov.

Desmodium celebicum Schindl. in Repert. Spec. Nov. Regni Veg. **21**: 6 (1925). [Type: Sulawesi. Macassar. Wichura 2011 (n. v.)].

Distr. Endemic to Sulawesi.

Desmodium styracifolium (Osbeck) Merr. in Am. J. Bot. **3**: 580 (1916); Enum. Philipp. Flow. Pl. **2**: 289 (1923); Schindl. in Repert. Spec. Nov. Regni Veg. **21**: 5 (1925), in Repert. Spec. Nov. Regni Veg. Beih. **49**: 301 (1928); Meeuwen in Reinwardtia **6**: 259 (1962), p. p.; H. Ohashi in Ginkgoana **1**: 224 (1973), p. p., excl. syn. *Hedysarum capitatum*, *Desmodium capitatum*, *Pseudarthria capitata*, *Meibomia capitata*, et *D. celebicum*; Rugayah in Floribunda **1**(8): 31, fig. 2 (1988); H. Ohashi in Dy Phon & al., Fl. Camb. Laos Vietn. **27**: 90, pl. 19 (1994), p. p., excl. syn. *H. capitatum*, etc.; Pedley in Rev. Handb. Fl. Ceylon **10**: 181 (1996).

Hedysarum styracifolium Osbeck, Dagbok Ostind. Resa: 247 (1757) [Type: from China. Dane's island, near Whampoa. Osbeck s. n. 25 Oct. 1851 (P), fide Merrill 1916].

H. retroflexum L., Syst. Nat., ed. 12, **2**: 494; Mant. Pl.: 103 (Oct. 1767) [Type: from India. Herb. Linn. No. 921.26 (LINN), fide Turland and Jarvis (1997)].

Desmodium retroflexum (L.) DC., Prodr. **2**: 336 (1825); Benth. in Miq., Pl. Jungh.: 223 (1852); Miq., Fl. Ned. Ind. **1**(1): 240 (1855); Craib, Fl. Siam. Enum. **1**: 416 (1928); Schindl. in Repert. Spec. Nov. Regni Veg. Beih. **49**: 295 (1928).

D. rotundifolium Wall. [Numer. List n. 5696 (1831–32); Schindl. in Repert. Spec. Nov. Regni Veg. Beih. **49**: 296 (1928), nom. nud.], non DC. (1825).

Distr.: Sri Lanka, India, Myanmar, Indo-China, **Malesia**, and S. China.

Desmodium tenax Schindl. in Repert. Spec. Nov. Regni Veg. **21**: 10 (1925) [Type: Australia. Queensland. Rockingham Bay. J. Dallachy (n. v.)]; Pedley in Austrobaileya **5**: 250 (1999).

D. rhytidophyllum F. Muell. ex Benth. subsp. *acutifoliorum* Verdc. in Kew Bull. **32**: 250 (1977) [Type: Papua. Arufi, sprawling shrub, height to 3 feet. Flowers pink. Henty & Katik 38667 (K holo.; iso. A, L)]; Verdc., Man. New Guinea Leg.: 406 (1979). (Fig. 4).

Distr.: **Malesia** (New Guinea) and Australia.

Specimens examined: **New Guinea**. Papua New Guinea. Henty & Katik 38667 (type of *D. rhytidophyllum* subsp. *acutifoliorum*).

Desmodium teres Wall. ex Benth. in Miq., Pl. Jungh.: 225 (1852), in adnota [Type: Burma (Myanmar), Taong Dong. Wallich 5694 (K holo.; iso. CAL)]; H. Ohashi in Ginkgoana **1**: 105 (1973); H. Ohashi in Hara, Origin Evol. Divers. Pl. & Pl. Commun.: 183 (1985) & in Dy Phon & al., Fl. Camb. Laos Vietn. **27**: 81, pl. 16 (1994).

D. zonatum auct. non Miq.: Meeuwen in Reinwardtia **6**: 97 (1961), p. min. p., cit. specim. Dorgeh 1755 (L).

Distr.: Myanmar, Thailand, Indo-China, and **Malesia**.

Specimens examined: **Jawa**. Bezveki, 600 m. C. A. Backer 24770 (BO); Kediri. Dorgeh 1755 (L). Bali. Old virgin forest, 200 m. alt. Shrub 40 cm high, flowers violet, green fruits. Dilmy 1081 (BO, K, L).

Occurence of this species in Malesia (Jawa) was recorded for the first time by H.Ohashi (1994 cited above). *Desmodium teres* is very similar to *D. zonatum* and the specimens cited were determined as the latter.

Fig. 4. *Desmodium tenax* Schindl. A: Holotype of *Desmodium rhytidophyllum* subsp. *acutifoliorum* Verdc. (K). B. Loments (enlarged from A).

Desmodium trichostachyum Benth., Fl. Austr. **2**: 234 (1864) [Type: Australia. Port Essington. Armstrong (K lecto. chosen by Pedley 1999)]; Meeuwen in Reinwardtia **6**: 261 (1962); H. Ohashi in Ginkgoana **1**: 244 (1973); Verdc., Man. New Guinea Leg.: 408 (1979); Pedley in Austrobaileya **5**: 237 (1999).

Distr.: **Malesia** (Maluku and New Guinea) and Australia (Northern Territory, Queensland).

Specimens examined: **Maluku**. Aru Islands. Pulau Trangan, Kp. Meme. 7.00S, 134.15E. Melaleuca savannah with Casurina. Moist spot. 15. 4. 1993. Turner 66 (L, TUS). **New Guinea**. Brass 7526 (A, BM, L); P. van Royen 4910 (L); Papua. Near Weam. Ridsdale NGF 33691. (A, L).

This is the new record of the species from Maluku. The voucher specimen was determined by Dr. Adima. Previously it has been known in New Guinea and Australia.

Desmodium trichostachyum is similar to *Desmodium triflorum*, but has a more slender and delicate habit and terminal or axillary racemes with far longer peduncles. The inflorescences of the latter are leaf-opposed and fasciculate.

Desmodium triflorum (L.) DC., Prodr. **2**: 334 (1825); Benth. in Miq., Pl. Jungh.: 221

(1852); Miq., Fl. Ned. Ind. **1**(1): 238 (1855); Ridl., Fl. Malay Penins. **1**: 606 (1922); Merr., Enum. Philipp. Flow. Pl. **2**: 289 (1923); Meeuwen in Reinwardtia **6**: 261 (1962); Backer & Bakh. f., Fl. Java **1**: 608 (1963); H. Ohashi in Ginkgoana **1**: 245 (1973); Verdc., Man. New Guinea Leg.: 409 (1979); Smith, Fl. Vitiensis Nova **3**: 193 (1985); Pedley in Austrobaileya **5**: 235 (1999).

Hedysarum triflorum L., Sp. Pl. 749 (1753), p. p., excl. var. β & var. γ. [Type: Ceylon. Herb. Hermann **1**: 21, No. 297. (BM lecto. by Pedley in Turland and Jarvis 1997)].

Distr.: Worldwide in tropics, a native of tropics of Asia and Africa. **Malesia** (throughout). Native or introduced in Australia. In western Asia, it is recorded in North Yemen and Iran (Lock and Simpson 1991).

Previous lectotypification of *Hedysarum triflorum* L. as Herb. Linn. No. 921.45 (LINN) was revised by Pedley in Turland & Jarvis (1997) as cited above.

Desmodium velutinum (Willd.) DC., Prodr. **2**: 328 (1825); Miq., Fl. Ned. Ind. **1** (1): 246 (1855); Meeuwen in Reinwardtia **6**: 264 (1962); Backer & Bakh. f., Fl. Java **1**: 607 (1963); H. Ohashi in Ginkgoana **1**: 192 (1973); Verdc., Man. New Guinea Leg.: 411 (1979); Pedley in Austrobaileya **5**: 248 (1999).

Hedysarum velutinum Willd., Sp. Pl. **3**(2): 1174 (1802) [Type: India. Herb. Willdenow 13763 (B-W)].

H. lasiocarpum P. Beauv., Fl. Oware Benin **1**: 32, pl. 18 (1805).

H. latifolium Roxb. [Hort. Beng.: 57 (1814), nom. nud.] ex Ker-Gawler in Bot. Reg. **5**: t. 355 (1819) [Type: India. cult. in Calcutta Bot. Gard. Roxburgh (K, n. v.)].

Desmodium lasiocarpum (P. Beauv.) DC., Prodr. **2**: 328 (1825); Merr., Enum. Philipp. Flow. Pl. **2**: 286 (1923); Backer & Bakh. f., Fl. Java **1**: 607 (1963).

D. latifolium (Roxb. ex Ker-Gawler) DC., Prodr. **2**: 328 (1825); Benth. in Miq., Pl. Jungh.: 224 (1852); Miq., Fl. Ned. Ind. **1**(1): 246 (1855).

D. virgatum (Miq.) Zoll. & Moritzi [in Nat. Geneesk. Arch. Neerl. Ind. **3**: 58 (1846), comb. nud.] ex Prain in J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. **66**: 143 (1897), non Desv. (1813); Ridl., Fl. Malay Penins. **1**: 611 (1922); Merr., Enum. Philipp. Flow. Pl. **2**: 290 (1923).

D. latifolium var. *virgatum* Miq., Fl. Ned Ind. **1**(1): 247 (1855).

Key to the subspecies of *Desmodium velutinum*

1. Primary bracts 2.5–3.5 mm long, ca. 0.3 mm wide; secondary bracts 1.5–2 mm long ..... subsp. *velutinum*
1. Primary bracts 8–12 mm long, ca. 0.7 mm wide; secondary bracts 4–6 mm long ..... subsp. *longibracteatum*

subsp. **velutinum**: H. Ohashi in Ginkgoana **1**: 195 (1973).

Distr.: Africa and Asia. Introduced into N. Australia and tropical America (Pedley 1996, 1999). Asia: Sri Lanka, India, Thailand, Indo-China, **Malesia** (Jawa, Lesser Sunda Is., Malaya, New Guinea, Philippines, Sulawesi, Sumatera), China, and Taiwan.

subsp. **longibracteatum** (Schindl.) H. Ohashi in Ginkgoana **1**: 194 (1973).

Desmodium longibracteatum Schindl. in Repert. Spec. Nov. Regni Veg. **21**: 7 (1925) [Type: Yunnan, Szemao Mts., alt. 5000 ft. A. Henry 12557 (CAL lecto.; isolecto. NY)].

D. velutinum var. *longibracteatum* (Schindl.) van Meeuwen in Reinwardtia **6**: 265 (1962).

Distr.: India, Myanmar, Thailand, Indo-China, **Malesia** (Jawa: Tjiburial), and S. China (Yunnan and Guishou).

Specimens examined: Jawa. Holstvoogd 297 (L).

Desmodium zonatum Miq., Fl. Ned. Ind. **1**(1): 250 (1855) [Type: Jawa. in het bosch bij den Kampong Tjikoja (n. v.)]; Merr., Enum. Philipp. Flow. Pl. **2**: 290 (1923); Meeuwen in Reinwardtia **6**: 97 (1961) & 265 (1962); Backer & Bakh. f., Fl. Java **1**: 605 (1963); H. Ohashi in Ginkgoana **1**: 107 (1973); Verdc., Man. New Guinea Leg.: 412 (1979).

Desmodium ormocarpoides auct. non DC.: Merr. in Philipp. J. Sci., C. **5**: 82 (1910), p. p.; Ridl., Fl. Malay Penins. **1**: 610 (1922).

Distr.: Sri Lanka, India, Thailand, Indo-China, **Malesia**, Solomon Islands, S. China, and Taiwan.

Specimens examined: **Borneo**. Winkler 2755 (L). **Jawa**. Zollinger 1060 (BM), Schiffner 2044 (K, L); Backer 7271 (L); Monchy s.n. (L); Holstvoogd 300 (L). **Lesser Sunda Is**. Flores. Kostermans & Winawan 82 (BO, K). **Malaya**. Peninsula Malaysia. Ridley 14705 (BM). **Maluku**. Bacan. Ramalanto 902 (L); Ceram. Buwalda 5972 (L).Key. Tajero 300 (L). **New Guinea**: Papua. Kanosia. Carr 11479 (L, NY); Saputa. Carr 16355 (BM. L); Sogeri. Forbes 946 (BM, L); Gjellerup 39 (L); Nirnabvt Isl. Brass 25882 (US). **Philippines**: Alabat Island. Ramos & Edano Bur. Sci. 48196 (NY); Balabac Island. Ramos & Edano Bur. Sci. 49809 (NY); Bohol. Ramos Bur. Sci.42847 (A); Catanduanes Ramos & Edano Bur. Sci.75398 (NY); Cebu. McGregor Bur. Sci.1731 (NY); Luzon. Elmer 14444 (A, BM, GH, NY), 18191 (A, BM, CAS, GH, NY); Mindanao. Elmer 11064 (BM, NY), Ramos & Edano Bur. Sci.37365 (A, BM), Zwickey 176 (NY); Mindoro. Celestino & Castro PNH1937 (A); Negros. Elmer 10134 (A, BM, NY); Leyte. Wenzel 3 (BM); Samar. Merrill 5201 (NY), Ramos Bur. Sci.24139 (A, BM, NY); Bismarck. Warburg 20245 (BM). Sulawesi (fide Meewuwen 1962). **Sumatera**. Hooker 1841 (K); de Wilde & de Wilde-Duyfjes 13493 (K, L); Ketambe. de Wilde & de Wilde-Duyfjes 13943 (L, US); Tapianoeli. Toroes 5103 (US); Asahn. Bartlett & LaRue 145 (US).

This species is distributed in Solomon Islands: Florida Island. Brass 3516 (A, L).

Introduced species

Desmodium adscendens (Sw.) DC., Prodr. **2**: 332 (1825); Meeuwen in Reinwardtia **6**: 245 (1962); H. Ohashi in Ginkgoana **1**: 199 (1973); Verdc., Man. New Guinea Leg.: 392 (1979); Schubert in Ann. Missouri Bot. Gard. **67**: 627 (1980); Smith, Fl. Vitiensis Nova **3**: 192 (1985); Pedley in Rev. Handb. Fl. Ceylon **10**: 180 (1996).

Hedysarum adscendens Sw., Prodr.: 106 (1788) [Type: Jamaica. Swartz (S holo.)].

Desmodium trifoliastrum Miq., Fl. Ned. Ind. **1**(1): 248 (1855) [Type: Java. op het Trachyt-gruis van den Salak. Zollinger 904 (n. v.)]; Ridl., Fl. Malay Penins. **1**: 606 (1922); Merr., Enum. Philipp. Flow. Pl. **2**: 290 (1923).

D. thwaitesii Baker in Hook. f., Fl. Brit. Ind. **2**: 169 (1876) [Type: Ceylon. Thwaites 3327 (K holo.)].

D. adscendens (Sw.) DC. var. *trifoliastrum* (Miq.) Schindl. in Repert. Spec. Nov. Regni Veg. **21**: 8 (1925); Backer & Bakh. f., Fl. Java **1**: 608 (1963).

Distr.: Native of Central America and West Indies, introduced into Africa, Asia, and Pacific. Asia: Sri Lanka, S. India?, Indo-China, and **Malesia**. Verdcourt (1979) suggested that this species was originally a native of America and Pedley (1996) regarded this species to be native of the West Indies and Central America, and introduced into Africa and Asia, but not present in Australia.

Specimens examined: **Borneo**. Sarawak. Beccari 3212 (K); W.Koetai. Endert 2641 (A); Endert 3235 (A, L); Hallier 1358 (L); Hallier 2612 (L); Kutei. Meijer 539 (L). **Jawa**. Miq. 9/64 (K), Backer 1805 (K), Zollinger 904 (BM iso. of *Desmodium trifoliastrum* Miq.). **Malaya**. Peninsula Malaysia. Ridley 14708 (BM). **Maluku**. Ternate Halmaheira. Nedi 354 (BO); Ceram. Buwalda 5843 (A, BO, K). **New Guinea**. Misool. Pleyte 867 (BO); Aroe–Eil. Buwalda 5050 (BO); Rouffan River. Leeuwen 9847 (BO); Nanaupb. Leeuwen 10732 (BO); Ridesdale 33938 (L). **Philippines**. Luzon. Mendoza PNH18430 (L). **Sulawesi**: Johansson & al. 570 (L); Meijer 9686 (L); Koorders 17606 (L). **Sumatera**. Gadjah via Oreng naar Pendeng. Steenis 8854 (BO); Palembang. Steenis 3815 (BO), Voogd 461 (BO); Bangka. Bunnemeijer 2165 (BO); Enggano. Lütjeharms 5391 (BO, GH, L).

Desmodium cajanifolium (Kunth) DC.,

Prodr. **2**: 331 (1825); Baker in Hook. f., Fl. Brit. Ind. **2**: 161 (1876); Schubert in Ann. Missouri Bot. Gard. **67**: 635 (1980); H. Ohashi in Sci. Rep. Tohoku Univ. ser. 4, Biol. **39**: 175, fig. 1, a (1988) & in Wagner & al., Man. Flow. Pl. Hawaii **1**: 666 (1990); Pedley, Rev. Handb. Fl. Ceylon **10**: 192 (1996).

Hedysarum cajanifolium Kunth in H.B.K., Nov. Gen. Sp. **6**: 525, t. 598 (1824) [Type: Amérique Equatoriale, Herb. Humboldt & Bonpland (P holo., fide Schubert 1980).

Desmodium walkeri Arn., Nov. Actorum Acad. Caes. Leop. Carol. Nat. Cur. **18**: 331 (1836).

Meibomia cajanifolia (Kunth) Kuntze, Rev. Gen. Pl. **1**: 195 (1891); Schindl. in Repert. Spec. Nov. Regni Veg. Beih. **49**: 344 (1928).

Distr.: Native to Mexico, Central and northern S. America. Introduced into Sri Lanka (perhaps early 1800's), Hawaii, and **Malesia**.

Specimen examined: **Jawa**: Lawang. Bnijsmm s. n. (K).

Desmodium distortum (Aubl.) Macbr. in Field Mus. Bot. **8**: 101 (1930); Verdc., Man. New Guinea Leg.: 396 (1979); Schubert in Ann. Missouri Bot. Gard. **67**: 638 (1980).

Hedysarum distortum Aubl., Hist. Pl. Guiane **2**: 774 (1775) [Type: Guyane. Aublet (BM holo. fide Schubert 1980).

H. asperum Poir. in Lam., Encycl. **6**: 408 (1805).

Desmodium asperum (Poir.) Desv., J. Bot. Agric. **1**: 122 (1813).

Meibomia distorta (Aubl.) Schindl. in Repert. Spec. Nov. Regni Veg. **22**: 281 (1926) & in Repert. Spec. Nov. Regni Veg. Beih. **49**: 346 (1928), non Schindl. (1924).

Distr.: Native of Mexico to northern S. America; introduced in Africa and **Malesia**.

Specimen examined: **New Guinea**. Morobe District. C. Edwards NGF 27495 (A, K).

This species is similar to *Desmodium tortuosum*, but has a slender, short pedicel (6–10 mm long against 10–16 mm long in *D. tortuosum*) and also smaller (1.5–2.5 mm long, 1.5–2 mm wide against 3–3.5 mm long, 2.6–3.5 mm wide in *D. tortuosum*) and strongly twisted loments (Schubert 1980).

Desmodium incanum (G. Mey.) DC., Prodr. **2**: 332 (1825).

Hedysarum canescens Mill., Gard. Dict., ed. 8 (1768), non L. (1753).

Hedysarum racemosum Aubl., Hist. Pl. Guiane Fr. **2**: 774 (1775) [Type: Plumier, ed. Burman, Pl. Amer. 140, t. 149, fig. 1 (1757), "Hedysarum foliis ternatis, ovatis, floribus specatis", fide Nicolson (1978)], non *Desmodium racemosum* DC. (1825) based on *H. racemosum* Thunb. (1784).

H. frutescens Jacq., Hort. Bot. Vindob. **3**: 47, t. 89 (1776), non L. (1753).

H. supinum Sw., Prodr. 106 (1788) & Fl. Ind. Occ. **3**: 1264 (1806), non Chaix ex Villars (1779).

H. incanum Sw., Prodr.: 107 (1788), non Thunb. (1784). Illegitimate renaming of *H. racemosum* Aubl. (fide Nicolson 1978).

H. canum J.F.Gmelin, Linn. Syst. Nat. ed. 13, **13**(3): 1124 (1791). Based on Plumier, t. 149, fig. 1 (1757). Illegitimate renaming of *H. racemosum* Aubl. (fide Schubert 1981).

H. canum Lunan, Hort. Jam. 305 (1814). Renaming of *H. incanum* Sw. (fide Schubert 1981).

Aeschynomene incana G. Mey., Prim. Fl. Esseq.: 245 (1818) [Type: Plumier, t. 149, fig. 1 (1757)]. Based on *H. incanum* Sw.

Hedysarum malacophyllum Link, Enum. Hort. Berol. Alt.: 247 (1822) [Type: Luzon (Cavite?). Chamisso (B holo., fide Merrill (1910, 1923), but is not found in B)].

H. ancistrocarpum Ledeb., Suppl. Index Sem. Dorpat. 4 (1825).

Desmodium malacophyllum (Link) DC., Prodr. **2**: 338 (1825); Merr. in Philipp. J. Sci., C. **5**: 84 (1910) & Enum. Philipp. Flow. Pl. **2**: 287 (1923).

D. ancistrocarpum (Ledeb.) DC., Prodr. **2**: 331 (1825).

Desmodium racemiferum DC., Prodr. **2**: 331 (1825). Based on *H. racemosum* Aubl., non Thunb. (1784), nec *D. racemosum* DC. (1825). (fide Schubert 1981).

D. incanum DC., Prodr. **2**: 332 (1825) [Type: Plumier, t. 149, fig. 1 (1757)]; Nicolson in Taxon **27**: 365 (1978); Schubert in Ann. Missouri Bot. Gard. **67**: 640 (1981); Smith, Fl. Vitiensis Nova **3**: 191 (1985); H. Ohashi in Sci. Rep. Tohoku Univ. ser. 4, Biol. **39**: 178, fig. 1, b (1988); H. Ohashi in Wagner & al., Man. Fl. Pl. Hawaii **1**: 667, t. 90 (1990); Isely, Vasc. Fl. South. US. **3**(2): 167 (1990); Isely, Native Naturalized Leg. (Fabac.) U.S.: 544 (1998); Pedley in Austrobaileya **5**: 255 (1999).

Meibomia malacophylla (Link) Kuntze, Rev. Gen. Pl. **1**: 198 (1891).

M. adscendens (Sw.) DC. var. β. *incana* (Sw.) Kuntze, Rev. Gen. Pl. **1**: 195 (1891).

M. incana (DC.) Vail in Bull. Torrey Bot. Club **19**: 118 (1892).

M. supina (Sw.) Britton in Ann. New York Acad. Sci. **7**: 83 (1892).

Desmodium supinum (Sw.) DC. var. *amblyophyllum* Urb., Symb. Ant. **7**: 229 (1911).

D. canum Schinz & Thellung in Schellenb., Schinz & Thell., Mém. Soc. Ne uchâtel. **5**: 371 (1913); Schubert in Field Mus. Nat. Hist. Publ. Bot. **13**(3): 423 (1943) & in Fl. Trop. E. Afr. Leg. Pap.: 456 (1971); Walker, Fl. Okinawa: 569 (1976); Verdc., Man. New Guinea Leg.: 394 (1979).

Meibomia cana (J. F. Gmelin) S. F. Blake in Bot. Gaz. **78**: 276 (1924).

Desmodium frutescens Schindl. in Repert. Spec. Nov. Regni Veg. **21**: 9 (1925) [Type: Jacq., Hort. Vindob. 3: 47, t. 89 (1776) "*Hedysarum frutescens* Jacq. non L."] & in Repert. Spec. Nov. Regni Veg. Beih. **49**: 275 (1928); Meeuwen in Reinwardtia **6**: 267 (1962).

D. frutescens Schindl. var. *amplyophyllum* (Urb.) Schindl. in Repert. Spec. Nov. Regni Veg. **21**: 9 (1925).

Desmodium sp.: Meeuwen in Reinwardtia **6**: 267 (1962) [Voucher specimen: Hollandia. B. O. van Zanten H75 (L)].

Distr.: America (Florida and Texas to Urugauay and Argentina), introduced widely in tropical and subtropical Africa, Asia, Australia and Pacific islands.

Specimens examined: **New Guinea**. Sauveur 2552a (L), Larivita & Katik LAE70518 (L), J. van den Assem 6 (L). Irian Jaya. Widjaja & Hamzah 2926 (BO, L); Pagai. Sauveur 2552a (L); Hollandia. B.O. van Zanten H75 (L).

Desmodium incanum DC. is superseded by *Aeschynomene incana* G. Mey. and *Hedysarum malacophyllum* Link.

Aeschynomene incana (Sw.) G. Mey. was published in 1818 on the basis of *Hedysarum incanum* Swartz. *Hedysarum incanum* Swartz is based on *Hedysarum foliis ternatis, ovatis, floribus spicatis* Plumier, ed. Burman, Pl. Amer. p. 140, t. 149, f. 1. 1757 (Nicolson 1978). He regarded this name as illegitimate renaming of *H. racemosum* Aubl. Under Article 58 in ICBN (Greuter et al. 2000), *Aeschynomene incana* should be treated as a legitimate new name with priority from 1818, not as a new combination with priority from Swartz in 1788. *Aeschynomene incana* (Sw.) G. Mey. was determined by Schindler (1928) as *Desmodium frutescens* (Jacq.) Schindl. and by Schubert (1980) as *D. incanum* DC.

Hedysarum malacophyllum Link is known only from the type that was collected by Chamisso in Luzon, the Philippines (Merrill 1910). Merrill (1910, 1923) could not clarify the identity of *D. malacophyllum*, but Schindler (1928) identified it *D. frutescens* (Jacq.) Schindl. Meeuwen (1962) treated *D. malacophyllum* as a synonym of *D. frutescens* (Jacq.) Schindl. of a doubtful species in Malesia. Merrill (1910, 1923) and Meeuwen (1962) did not recognize *D. malacophyllum* as identical with *Desmodium*

incanum DC. or *D. canum* (Gmel.) Schinz & Thellung. Nicolson (1978) treated the names related to *D. incanum* DC., but overlooked *Aeschynomene incana* G. Mey. and *Hedysarum malacophyllum* Link. *Desmodium frutescens* Schindl. is regarded as a synonym of *D. incanum* DC. (Nicolson 1978, Schubert 1980).

Meeuwen (1962) listed a "44. *Desmodium* sp." from New Guinea under the unidentified species category, but the voucher specimen in L was confirmed by me as *Desmodium incanum* (G. Mey.) DC. (annotated as *D. incanum* DC.).

Desmodium incanum is widespread in tropical areas of the world, but is originally distributed in the warmer parts of America from southern Florida and Texas to Uruguay and Argentina (Schubert 1971).

Desmodium intortum (Mill.) Urb., Symb. Antill. **8**: 292 (1920); Schubert in Field Mus. Nat. Hist. Publ. Bot. **13**(3): 427 (1943); Fosberg in Micronesica **4**: 256 (1968); Verdc., Man. New Guinea Leg.: 400 (1979); Schubert in Ann. Missouri Bot. Gard. **67**: 646 (1980); H. Ohashi in Sci. Rep. Tohoku Univ. ser. 4, Biol. **39**: 62 (1985) & 181. fig. 4a (1988) & in Wagner & al., Man. Fl. Pl. Hawaii **1**: 667, plate 90 (1990); Pedley in Austrobaileya **5**: 255 (1999).

Hedysarum intortum Mill., Gard. Dict. ed. 8, *Hedysarum* no. 11 (1768) [Type: Cultivated in England from seeds sent from Jamaica. Houston (?BM n. v.)].

H. uncinatum Jacq., Pl. Hort. Schoenbr. **3**: 27, t. 298 (1798) [Type: Crescit in Caracas (W?, see Pedley 1999)].

Desmodium uncinatum (Jacq.) DC., Prodr. **2**: 331 (1825); Schubert in Field Mus. Nat. Hist. Publ. Bot. **13**(3): 412 (1943); Meeuwen in Reinwardtia **6**: 266 (1962); Backer & Bakh. f., Fl. Java **1**: 606 (1963), incl. *D. intortum* F. & R.; Verdc., Man. New Guinea Leg.: 411 (1979); Pedley in Austrobaileya **5**: 253 (1999).

Meibomia uncinatum (Jacq.) Kuntze, Rev. Gen. Pl. **1**: 197 (1891).

M. intorta (Mill.) Blake in Bot. Gaz. **78**: 286 (1924); Schindl. in Repert. Spec. Nov. Regni Veg. Beih. **49**: 348 (1928).

Desmodium nantouensis Y. C. Liu & F. Y. Lu in Quart. J. Chinese Forest. **12**: 82 (1979). [Type: Taiwan. Nantou Hsien. Shueli. F.Y. Lu & C.H. Ou 5810A. 13 Dec. 1978 (NCUF holo., iso. TPCA)].

Taxonomic problems among the *Desmodium intortum-uncinatum* complex were reviewed by Ohashi (1988). The distinctions between *D. uncinatum* and *D. introtum* are complex and include features of the leaflets, articles and stem as follows (Schubert 1943, 1980, Verdcourt 1979, Pedley 1999): *D. intortum* has a terete to angulate stem, leaflets uniformly green on the upper surface and the articles mostly 4 mm long and 2 mm wide; while *D. uncinatum* has the deeply trisulcate stem, leaflets often with a pale mark along the middle on the upper surface and the articles 5–6 mm long, 3–4 mm wide. Fosberg (1968), however, regarded the complex as one species.

Key to the varieties of *Desmodium intortum*

1. Stems triangular with white spongy pith. Stipules ovate, acuminate to caudate. Leaflets uniformly appressed-hairy above, terminal ones broadly ovate to rhombic, acute to acuminate at the apex, cuneate to rounded at the base ....var. *intortum*
1. Stems terete, solid. Stipules narrowly triangular to triangular, acuminate. Leaflets entirely or almost glabrous above, terminal ones ovate to narrowly ovate, usually acute at the apex, obtuse to cuneate at the base .....var. *pilosiusculum*

var. **intortum**

Distr.: A native of tropical America; intro-

duced as a pasture legume and naturalized in tropical and subtropical Africa, Asia and Australia. In **Malesia**, New Guinea and the Philippines.

Specimens examined: **New Guinea**. Papua New Guinea. Henty 49182 (A) & 49190 (K); along Kundi awa–Gumbini road. Verdcourt 5200 (A, K); Middle Creek, 7 km W of Bulolo. Kairo 647 (A); Vicinity of Panggema village. Milliken 1476 (A).

var. **pilosiusculum** (DC.) Fosberg in Micronesica **4**: 257 (1968).

Desmodium pilosiusculum DC., Prodr. **2**: 335 (1825) [Type: Philippines? (ex herb. Thibaud.), fide Candolle 1825].

D. limense Hook. in Bot. Misc. **2**: 215 (1831).

D. sandwicense E. Mey. in Linnaea **24**: 230 (1851); Degener, Fl. Hawai. (1934); H. Ohashi in Sci. Rep. Tohoku Univ. ser. 4, Biol. **39**: 183, fig. 4c (1988) & in Wagner & al., Man. Fl. Pl. Hawaii **1**: 669, plate 90 (1990).

Meibomia limensis (Hook.) Kuntze var. *pilosiuscula* (DC.) Schindl. in Repert. Spec. Nov. Regni Veg. **20**: 275 (1924); in Repert. Spec. Nov. Regni Veg. Beih. **49**: 349 (1928).

Distr.: A native of tropical America; introduced as a pasture legume and naturalized in tropical and subtropical Africa, Asia and Australia.

Desmodium procumbens (Mill.) Hitchc. in Ann. Rep. Missouri Bot. Gard. **4**: 76 (1893); Merr., Enum. Philipp. Flow. Pl. **2**: 288 (1923); Meeuwen in Reinwardtia **6**: 255 (1962); Schubert in Ann. Missouri Bot. Gard. **67**: 652 (1981).

Hedysarum procumbens Mill., Gard. Dict. ed. 8, *Hedysarum* no. 10 (1768) [Type: Jamaica. Houstoun collected in 1730 (BM holo.), fide Schubert (1971)]

Meibomia procumbens (Mill.) Schindl. in Repert. Spec. Nov. Regni Veg. **20**: 151 (1924); Schindl. in Repert. Spec. Nov. Regni Veg. Beih. **49**: 352 (1928).

Distr.: Tropical America, and introduced into Africa, Polynesia, and **Malesia**: Philippines and Maluku (Ambon).

Specimens examined: **Philippines**: Manila. Merrill 636 (BM, GH, K, US), Loher 2344 (K), Ramos Bur.Sci.12209 (BM, CAS, K), Ramos Bur.Sci.78759 (K), San Pedro Macati. Merrill 13 (US).

Desmodium scorpiurus (Sw.) Desv., J. Bot. Agric. **1**: 122, pl. 5 fig. 15 (1813); DC., Prodr. **2**: 333 (1825); Merr., Enum. Philipp. Flow. Pl. **2**: 289 (1923); Schindl. in Repert. Spec. Nov. Regni Veg. Beih. **49**: 354 (1928); Schubert in Mcbride, Fl. Peru **13**: 433 (1943); Meeuwen in Reinwardtia **6**: 258 (1962); Hatus., Fl. Ryukyus 326 (1971); H.Ohashi in Ginkgoana **1**: 95 (1973); Huang & H.Ohashi, Fl. Taiwan **3**: 266, pl. 576 (1977); Verdc., Man. New Guinea Leg.: 407 (1979); Schubert in Ann. Missouri Bot. Gard. **67**: 656 (1980); Smith, Fl. Vitiensis Nova **3**: 190 (1985); Howard, Fl. Lesser Antill., Leeward & Windward Is. **4**(1): 482 (1988); Huang & H. Ohashi, Fl. Taiwan ed. 2, **3**: 265, t. 128 (1993); Pedley in Austrobaileya **5**: 233 (1999).

Hedysarum scorpiurus Sw., Prodr.: 107 (1788). [Type: Jamaica. Swartz (S holo.)].

Desmodium virgatum Desv., J. Bot. Agric. **1**: 122. 1813.

Meibomia scorpiurus (Sw.) Kuntze, Rev. Gen. Pl. **1**: 198 (1891).

Desmodium akoense Hayata, Icon. Pl. Formosan. **9**: 23, fig. 14 (1920) [Type: Formosa. Ako. Y. Matsuda 95, April 1915 (TI holo.)].

Nissoloides cylindrica M. E. Jones, Contr. West. Bot. **18**: 135 (1935) [Type: Mexico, Jalisco, Guadalajara. Jones 3784 (GH iso, fide Schubert 1980)].

Distr.: West Indies and Mexico southward to Peru (Smith 1985). Introduced into **Malesia** (from tropical America. fide Merrill 1923), China, Taiwan, Australia, and Pacific.

Specimens examined: **Lesser Sunda Is.** Flores. Wieringa 1814 (US). Lombok. Elbert 556 (L), Elbert

648 (L), Elbert 788 (L). Timor. Kooy 776 (L). **Philippines**. Luzon. Loher 2343 (K) & 2410 (K), Merrill 385 (K), Williams 291 (K, NY), Elmer 15540 (BM, K, L, NY), Usteri 122h (K), Ramos & Edano Bur.Sci.37958 (BM), McGregor Bur.Sci.11480 (BM), Ramos 1427 (BM, L), Ramos Bur.Sci.12210 (L). Batan. Ramos Bur. Sci.80035 (NY). **New Guinea**. Ca. 1 km S of Soputa village. Hoogland 3756 (A, BM, K, L, US); Near W. end of Dobodura airstrip. Hoogland 3799 (A, K, L), Womersley 5382 (A, K, L). **Sulawesi**. E. Hennipman 5029 (A, L).

Desmodium tortuosum (Sw.) DC., Prodr. **2**: 332 (1825); Meeuwen in Reinwardtia **6**: 260 (1962); Backer & Bakh. f., Fl. Java **1**: 605 (1963); Schubert in Fl. Trop. E. Afr. Leg. Pap.: 474 (1971) & in Ann. Missouri Bot. Gard. **67**: 658 (1981); Verdc., Man. New Guinea Leg.: 408 (1979); Smith, Fl. Vitiensis Nova **3**: 191 (1985); H. Ohashi in Sci. Rep. Tohoku Univ. ser. 4, Biol. **39**: 186, fig. 4, b (1988) & in Wagner & al., Man. Fl. Pl. Hawaii **1**: 669, t. 90 (1990); Pedley in Rev. Handb. Fl. Ceylon **10**: 191 (1996) & in Austrobaileya **5**: 253 (1999).

Hedysarum purpureum Miller, Gard. Dict. ed. 8, *Hedysarum* no. 6 (1768) [Type: Mexico, Vera Cruz, in 1730. Houston (BM holo.)].

H. tortuosum Sw., Prodr.: 107 (1788) [Type: Jamaica. Swartz (S holo.; iso. Herb. Willdenow 13803 in B, fide Schubert 1971)].

Desmodium stipulaceum DC., Prodr. **2**: 330 (1825); Benth. in Miq., Pl. Jungh.: 229 (1852); Miq., Fl. Ned. Ind. **1**(1): 252 (1855).

D. stipulaceum var. *aparine* Miq., Fl. Ned. Ind. **1**(1): 252 (1855).

Meibomia tortuosa (Sw.) Kuntze, Rev. Gen. Pl. **1**: 198 (1891).

M. purpurea (Mill.) Vail in Small, Fl. S. E. US: 639 (1903); Schindl. in Repert. Spec. Nov. Regni Veg. Beih. **49**: 352 (1928).

Desmodium purpureum (Mill.) Fawcett & Rendle, Fl. Jamaica **4**: 36 (1920), non Hook. & Arn. (1832).

Distr.: Naturalized in **Malesia**, originally from America (Southern United States to subtropical S. America), but now widely naturalized in tropics of the Old World.

Specimens examined: **Philippines**. Luzon. Canicosa 442 (A); U.P. Gueyen. Dion 59 (A); Mt. Makiling. Sulit 6940 (A); Ilocos Norte. Iwatsuki & al. 942 (L); Quezon. Sulit PNH14948 (L). **New Guinea**. Finschhafen. Floyd 5475 (BM, K), Verdcourt et al. 4901 (K); Markham Bridge. Coode & al. 29545 (A); Kajabit. Clemens 10509 (A); Finschhafen. Clemens 4215 (A); Bulolo. Millar 14528 (A); Camp 2, Bulolo. Streimann & Kairo 44008 (A); Menapi. Brass 21832 (A, K); Nadzab. Henty 11515 (A); Aiyura. Henty 49193 (A) & Henty 49185 (A).

Species excluded

Desmodium viridiflorum Beck (1833), non DC. (1825): Meeuwen in Reinwardtia **6**: 266. (1962).

Meeuwen (1962) recorded this species from Jawa based on a record by Backer probably in Bull. Jard. Bot. Btzg. II, no. 13: 15 (1913), but Backer and Bakhuizen van den Brink (1963) did not list it in Jawa. I could not find the voucher specimen in BO or L. The species should be excluded from the members of the genus known from Jawa.

大橋広好：**Malesia** のマメ科シバハギ属と近縁属の分類と分布（I）

この論文は Malesia 地域のシバハギ属とその近縁属をまとめたものである．本論文は２つに分割されている．前編には Introduction から属名のアルファベット順でシバハギ属 *Desmodium* まで，後編には *Hanslia* から *Trifidacanthus*，植物地理学的考察および引用文献が含まれる．

シバハギ属とその近縁属についてアジアとオーストラリアの種類が分かってきたのにもかかわらず，Malesia 地域のものは近年の研究から取り残されていて，全容が知られていない状態にある．本論文は Flora Malesiana にこれらの属について執筆するために始めた研究の全体的な概要を先行的

にまとめたもので，分類群の記載は Flora Malesiana に含まれる予定である．本論文では，全種類の検索表を作り，学名（正名と主に Malesia 地域で使われた異名），文献（主に Malesia 地域で行われた研究），分布（全体と Malesia 地域）を整理し，さらに調べた主な標本を引用し，分類学的なノートを付けた．また，それらの分布について植物地理学的な解析を試みた．

Malesia と呼ばれる地名は植物地理学上の区系として名付けられている．日本語では国家としてのマレーシア Malaysia と混同しやすいので，以下では Malesia のままで表記する．Malesia は1857年に Heinrich Zollinger によって植物区系として命名され，今日では Flora Malesiana 計画の対象とする地域としても知られている．ただし，ニューギニアやビスマルク諸島は Papuasia として Malesia に含めない考えがあるが，この論文ではこれらを含めた Flora Malesiana で扱われている地域を対象とした．Malesia に含まれる国家としてはインドネシア，マレーシア，シンガポール，フィリピン，ブルネイ，パプアニューギニアの 6 国がある．Malesia のフロラについて日本語では永益による最近の概説（永益英敏 2000．熱帯アジアの植物相．岩槻邦男・加藤雅啓（編），多様性の植物学．第 1 巻 pp. 48–78．東京大学出版会，東京）がある．

和文表題とこの摘要の中で用いているシバハギ属は *Desmodium* の和名である．本文中で述べたように，Bentham (1865b) によって設定された広い意味での *Desmodium* は世界で広く使われてきているが，属の範囲に矛盾があるため，これまでもより適正な範囲への改訂案がいくつか提案されてきていて，私も1973年にこれを狭い範囲に再定義した（Ohashi 1973）．その後さらにこの属の範囲を狭めることが正しいと判断し，解決策の一つとして2000年にヌスビトハギと近縁種を *Hylodesmum* 属として *Desmodium* から分離した（Ohashi and Mill 2000）．このため，古くからヌスビトハギ属の学名として広く用いられてきた *Desmodium* にヌスビトハギが含まれなくなったので，その和名をシバハギ属と変更した（大橋広好 2002 *Desmodium*, *Hylodesmum* および *Ohwia* 属の和名 植物研究雑誌 **77**: 59–60）．

これまで Malesia のシバハギ属とその近縁属としてまとめられた成果には Meeuwen (1962) および Ohashi (1973) がある．Meeuwen (1962) は Bentham (1865) の属の範囲を採用し，*Desmodium* 属の下で42種に 1 疑問種と 1 不明種よりなる44種を記録した．その内 6 種はアメリカからの帰化種であった．Ohashi (1973) は帰化種を除いて自生種と思われる種類だけを対象とし，36種を認めてこれを 7 属に分類した．

今回の研究では，アメリカからのシバハギ属の帰化種 8 種を含み，次の13属64種が明らかとなった．それらは *Aphyllodium* 3 種，マイハギ属 *Codariocalyx* 3 種，ナハキハギ属 *Dendrolobium* 8 種，*Desmodiastrum* 1 種，シバハギ属 *Desmodium* 36種，*Hanslia* 2 種，*Hegnera* 1 種，ヌスビトハギ属 *Hylodesmum* 4 種，*Monarthrocarpus* 1 種，ミソナオシ属 *Ohwia* 1 種，ウチワツナギ属 *Phyllodium* 2 種，タデハギ属 *Tadehagi* 1 種および *Trifidacanthus* 1 種である．

この前編ではヒメノハギの所属をシバハギ属からマイハギ属に変更した．ヒメノハギは発達した仮種皮のある種子をもつことでシバハギ属の中で独特の存在であったが，仮種皮が発達する特徴のあるマイハギ属に移し，*Codariocalyx microphyllus* (Thunb.) H. Ohashi とした．

また，本論文では，現在世界で広く使われている学名 *Desmodium incanum* DC. を *Desmodium incanum* (G. Mey.) DC. に改めた．*Desmodium incanum* (G. Mey.) DC. は現在世界の熱帯と亜熱帯に広く分布するが，その原産は北アメリカ南部からウルグアイ，アルゼンチンまでの地域である．本種は沖縄にも帰化しており，タチシバハギと呼ばれている．現在の学名 *Desmodium incanum* DC. は比較的新しく1825年に De Candolle によって発表されたものであるが，それ以前の学名が非正式名であるとみなされたり，正名であっても *Desmodium* に組み替えることのできないものであったため，詳細な文献調査とかなり複雑な命名上の論議を経て，1978年以来正名とみなされるようになったものである（Nicolson 1978）．異名の中にはヌスビトハギの学名として東アジアで使い慣れていた *Desmodium racemosum* (Thunb.) DC. が使えなくなった原因である1775年に発表された *Hedysarum racemosum* Aubl. も含まれている．ところが，これまでの *Desmodium incanum* DC. に関する論議の中で，*Aeschynomene incana* G. Mey. (1818) が見落とされていることに気付いた結果，その正名は *Desmodium incanum* (G. Mey.) DC. であることを明らかにした．

（東北大学大学院理学研究科
附属植物園津田記念館）